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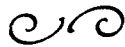
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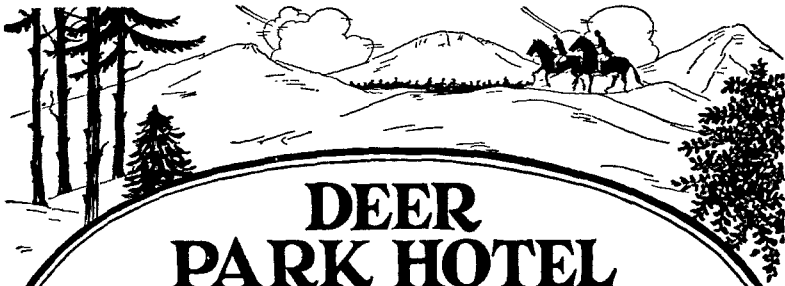
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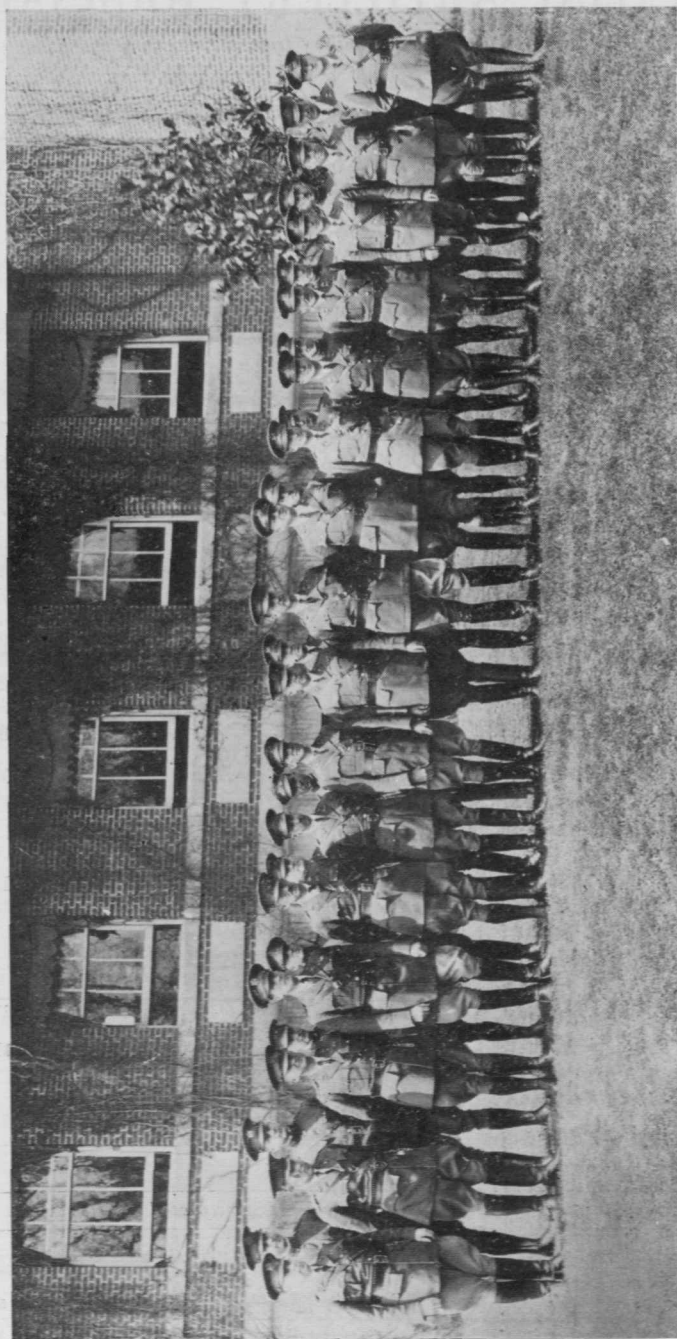
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THE COAST ARTILLERY JOURNAL

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The Fifth French Army In August, 1914

By LIEUTENANT COLONEL NED B. REHKOPF

Field Artillery

ORGANIZATION

The French War Plan (Plan XVII) provided for a Fifth Army to be made up as follows:

Fifth Army (General Lanrezac).

- I Corps (General Franchet d'Esperey)
- II Corps (General Gérard)
- III Corps (General Sauret)
- X Corps (General Defforges)
- XI Corps (General Eydoux)
- 4th Cavalry Division (General Abboneau)
- 52d and 60th Reserve Divisions
- 1st Artillery Regiment (Heavy)
 - 6 batteries of 120-mm. Baquet Howitzers
 - 7 batteries of 155-mm. Howitzers.
- 1 battalion, 4th Artillery (Heavy)
 - 4 batteries of 120-mm. guns.

The total war strength of this army, including units of the supply services, was approximately 300,000; comparable to our type army of over 306,000. The organization differs, however, from that of our type army in the number of corps; in the number and types of army artillery units, and in the absence of army air service, army trains, and other army troops.

In time of peace an army corps was the largest organized unit, one corps being assigned to each of the twenty-one corps regions into which the country and North Africa were divided. Usually a corps consisted of:

- 2 Divisions of infantry of 4 regiments of 3 battalions of 4 companies each.
- 2 Reserve infantry regiments.

MAPS: Theater of Operations in Western Europe, 1:575,000.

Carte de France et des Frontiers, 1:200,000: Maubenge, Mézières, Châlons, Aix-la-Chapelle, Longwy, and Metz sheets.

- 45 Batteries of artillery (this includes both the corps and division artillery).
- 1 Regiment of cavalry (4 active and 2 reserve *escadrons* or troops).
- 4 Companies of engineers.

The frontier corps had additional strength; for example, the II Corps had one active brigade in addition to the two divisions. The total war strength of a corps varied from 44,000 to 60,000.

Under the military service law a man was required, beginning with his twentieth year, to serve three years with the active army, eleven years in the reserve, seven years in the territorial army, and seven years in the territorial reserve. In time of peace, infantry companies were maintained at a strength of 190 or 200 men in the frontier corps and about 140 men in interior corps. The war strength of a company was 250 men. A cavalry regiment had a peace strength of 740 men and a war strength of 1,140 men. Field artillery batteries had from 90 to 140 men in peace and 200 men in war. Like our regular army, these peace-time organizations were stationed at various places in the corps regions, frequently at regimental posts, but sometimes at battalion or even one and two-company posts.

THE ARMY COMMANDER

Charles Louis Marie Lanrezac was born at Guadeloupe on July 31, 1852, and was, therefore, sixty-two years old at the outbreak of the World War. He entered St. Cyr at the age of seventeen and was turned out early as a lieutenant in the war of 1870. He reached the grade of Captain at twenty-four years; was an instructor at St. Cyr at twenty-eight; a Major and instructor at the Ecole de Guerre at forty; Lieutenant Colonel and assistant director of studies at the same school at forty-nine; Colonel and director of studies at fifty. After serving for a time in command of an infantry regiment, he was promoted to a general of brigade at 54, and served at Vannes in the XI Corps. As general of a division at 59, he commanded the 20th Division, stationed at St. Servan in the X Corps. Later he commanded the XI Corps region with headquarters at Nantes. On April 10, 1914, that is, less than four months before the outbreak of the war, he was made a member of the Superior Council of War, and about the middle of May, 1914, he received his designation as commander designate of the Fifth Army in the event of war. He protested to General Joffre against this assignment and asked for the First Army, because for the last five years he had been designated as Chief of Staff of that army and had studied the proposed theater of operations of that army. His request was not approved.

The inspection district allotted to him in time of peace, comprised the I, II, and XI Corps regions. When assigned to this duty, he was directed

to get in touch with the corresponding corps and to "exercise a certain amount of direction over them." With the other units designated to make up the Fifth Army he had no contact until they were placed under his command on the declaration of war. His staff, prior to the war, consisted of a chief-of-staff—General d'Oissel, a major as G-3, and a captain as aide.

General Lanrezac has been described as a man above average height, with a strong, powerful appearance and a loud voice. Everything about him indicated intelligence, force, impetuosity, rapid decision, and impulsiveness. While he was courteous, he was without pretext of urbanity and had a frankness which disavowed circumlocutions. This gave the impression of a rude simplicity.

Following the war of 1870, the French war plans underwent many changes and with these changes in plans went changes in military policies and doctrines. General Lanrezac did not go all the way with those, who, under the leadership of Colonel Grandmaison and others, so strongly advocated "the offensive from the beginning," "always the offensive." Among his writings while at the *Ecole de Guerre* appears the following quotation:

The result of the first engagements has a considerable influence on the morale of both armies and one ought, therefore, to avoid those doubtful affairs of which the enemy may be able to boast in order to sing of a victory and which, if well exploited, may give him appreciable moral advantages. The commander of a subordinate unit (corps or army) who, at the beginning of a campaign, engages in a serious affair with his forces alone, without being certain of coming out of it promptly and with success, besides exposing himself to a check susceptible of a bad moral effect on his troops, also risks leading the operations in a way other than that fixed upon by the commander-in-chief. The phrase, "to attack the enemy wherever found," so dear to the Germans in 1870, is very dangerous. If each subordinate unit commander has the right to bore in, with head down, against the first adversary he meets, the commander-in-chief is powerless to exercise the least control.¹

We "meditate" on this because the phrase, "attack the enemy where found," appears in some of our text-book orders written since the World War and we are committed to the principle of the offensive. To me the answer seems to be that subordinate units may very properly be ordered to attack the enemy where found, provided such attacks mean advancing against opposition, with a definite purpose or objective assigned by the commander-in-chief as a part of his general plan. In other words, the principle of "the offensive" must be combined with the principles of "unity of command," "unity of action," and objective," and the offensive must be supported by sufficient men and material, concentrated in ample time, so that there will be some prospect of carrying the plan through successfully. The mere enunciation of a principle wins no victories.

¹*Histoire Illustrée de la Guerre, Tome 5, p. 236.*

MOBILIZATION

The mobilization was based on the Instructions of February 15, 1909, modified in April, 1914, to meet the needs of the new law of three years service. It was designed to meet a major emergency (other plans were provided for lesser efforts) and the mobilization was extended later to meet the additional effort required. The plan provided for the mobilization of the combat elements of the active corps by the fourth day, of army troops by the eighth day, and of reserve units by the ninth day.

Under the operation of the Law of Three Years there were three classes serving with the active army at the outbreak of the war, two of them being recruit classes, because of the fact that the law had been enacted but recently. Each reservist had had some training, had been assigned to a unit, and knew when and where he was to report for mobilization. The mobilization plan was a zone of the interior and corps region matter; the army commanders had little or nothing to do with the plan nor with the mobilization. The army commanders, however, were familiar with the Instructions for mobilization.

At 4:55 P. M., July 30, 1914, the Minister of War issued orders to the five frontier Corps Region Commanders to carry out the preparatory measures of precaution and security in their regions, as provided for in the mobilization plan. These measures included recalling officers and men from leave and furlough; covering troops which were within marching distance of their covering positions were moved to their assigned places on the frontier; covering troops which had to move by rail held themselves ready to entrain; no reservists were called to the active army, but selected men of the territorial reserve were called to guard the railroads, bridges, and other means of communication near their homes. This covering phase will be discussed more in detail later.

At 4:00 P. M., August 1, the general mobilization order was issued by the President of the Republic to Corps Region Commanders, and by them was transmitted to subordinate commanders and to the civil authorities. The first day of mobilization (M day) was fixed as Sunday, August 2. In general, mobilization was by regiment; isolated companies were brought in to the regimental station for mobilization. In assigning reservists to units the principle had been followed of not assigning a man to a unit stationed at his home, but to a unit not far therefrom. When the active regiment had completed its mobilization and moved to the concentration area, extra officers, assigned to the active regiment for that purpose, took over the barracks of the active regiment and proceeded with the mobilization of the reserve regiment. These officers were one lieutenant colonel, three majors, and six captains.

The mobilization proceeded without special incident and the mobilization of the active combat units was completed on August 5, as planned. By this initial mobilization, France increased her active army from 736,000 to a total strength of 3,580,000 (including reservists and territorial reservists mobilized during this period), or an increase of four hundred per cent in nine days. The only criticisms of the French mobilization which I have found, relate to the fact that the plan did not make provisions for a proper distribution of skilled specialists nor for carrying on essential industries in the zone of the interior.

PLAN OF CAMPAIGN

According to the Bases of Plan XVII, the French general staff estimate of the enemy strength and probable intentions were briefly as follows: Germany can concentrate on the western front twenty active corps, ten reserve corps, eight cavalry divisions, and eight reserve divisions. It seems probable that an offensive movement by the bulk of these forces can not start before the thirteenth day of their mobilization. The possibility of a turning movement through Luxembourg and Belgium is recognized, but the breadth of such a movement is doubtful and it is believed that an important rôle will be assigned to a group of armies to be concentrated behind the Metz-Thionville position.

In any case the intentions of the Commander-in-Chief are to proceed, with all his forces united, to attack the German armies—the offensive to consist of two main efforts. The First and Second Armies, on the right, will operate initially between the Rhine and the Moselle above Toul. The Fifth Army and the Cavalry Corps, on the left, will operate north of the line Verdun-Metz in the direction of Thionville. The Third Army will connect the two offensive movements by operations on the Heights of the Meuse and in the Woevre. The Fourth Army will be placed initially in the second line, ready to move up either on the right or left of the Third Army. A group of reserve divisions will be placed in rear of each flank of the armies at the disposition of the Commander-in-Chief.

Accompanying the plan was a directive to each army, to the cavalry corps, and to each group of reserve divisions. The directive for the Fifth Army announced the composition of the army; announced the location of Fifth Army Headquarters as at Rethel; gave the zone of action, the south boundary of which was extended through Vilosnes-sur-Meuse—Haraumont—Ecurey—Damvillers—Romagne-sous-les-Côtes to the position of the covering force; and gave the mission as that of acting against the right wing of the enemy forces, whether the theater of operations was limited to the territory of the belligerents or whether it included, from the beginning, part of Luxembourg and Belgium. If the theater of operations was limited to France and Germany, the Fifth Army was to debouch from the heights

of the Meuse and from the bridgehead of Montmédy in the general direction of Thionville and Luxembourg for the purpose of driving to the north the enemy forces opposed to it. The directive goes on to state that the army ought to reserve a portion of its forces in rear of its left flank to cover that flank against any enveloping action the enemy might make in violating the neutrality of Belgium in the immediate vicinity of the frontier and that it ought also to consider, or to foresee, an attack in force by the Fifth Army against Thionville or an investment of that place. In the second eventuality (immediate violation of Luxembourg and Belgium by the Germans) the Fifth Army would move, but only on orders from the Commander-in-Chief, to the northeast in the region of Florenville and Neufchâteau, still protecting its left flank. Also in this case, the Fourth Army was to act, between the Fifth and Third Armies, in the direction of Arlon. This is the variant to the plan which was put into effect later. The Cavalry Corps, concentrating southeast of Mézières, was to cover the left of the armies. The directive concludes, "In consequence, the Fifth Army ought to be initially articulated and disposed in depth in such a manner as to be ready to move either to the east or to the northeast or to cross the Meuse on the twelfth day of mobilization." The concentration areas for each corps and reserve division, the detraining stations, and the supply points were given by G. H. Q. in the directive. Thus, little latitude was left to the army commander and a separate Army plan of concentration was unnecessary. The disposition of corps, as fixed by G. H. Q., does not show much depth; all corps excepting the II Corps, which furnished the covering force, were in line, faced slightly to the northeast.

The zone of action south of Belgium and Luxembourg, leading to the east, which was assigned the Fifth Army is approximately eight and a half miles in width. The main roads in this zone run generally north and south. The east and west roads, for the greater part, are of the second class. An advance in the direction of Florenville—Neufchâteau is also perpendicular, or at least oblique, to the general direction of the stream lines and national highways, and lies through the wooded and difficult region of the Ardennes forest. As a setting for a problem in the advance of an army, either direction offers many difficulties.

I have found no army plan of campaign, as such. The commander of the Cavalry Corps (General Sordet) on March 9, 1914, submitted to the general staff, a statement of how he proposed to carry out his mission, which amounts to a plan of campaign for that corps. General Lanrezac, on receipt of Plan XVII and the accompanying directive, about the middle of May, 1914, studied the plan and on July 25 began the preparation of a memorandum to General Joffre, which was forwarded on July 31.

This memorandum was prefaced with the statement that General Lanrezac thought it necessary to let General Joffre know, in a few words,

how he (Lanrezac) understood the execution of the mission assigned him, in such a way that General Joffre might be able, in ample time, to give such observations thereon as he might think appropriate. In effect, this memorandum was in part as follows:

The mission received by the Fifth Army, in the event of a violation of the neutrality of Belgium by the Germans, is to make a counter offensive in the general direction of Neufchâteau. The conditions under which that counter offensive will be possible are:

a. The Fifth Army, before becoming engaged in the wooded defiles of the Ardennes and the Semoy, be sure that it will be able not only to debouch freely from those defiles, but also to gain beyond them the necessary room in which to employ its forces. Practically that comes back to saying that it must be able to reach with its four left corps, ahead of the enemy, the line, Maissin—Paliseul—Bertrix—Saint-Médard (a line about six miles north of the Semoy).

That line is three days march (about forty-three miles in a direct line) from the German frontier. The Fifth Army, according to dates of its detraining schedule, cannot reach that line before the thirteenth day of mobilization.

b. It is indispensable that the II Corps should be relieved of its covering mission early enough to be ready to participate, on the right of the Fifth Army, in the action in which that army may be engaged as soon as its debouchment is terminated.

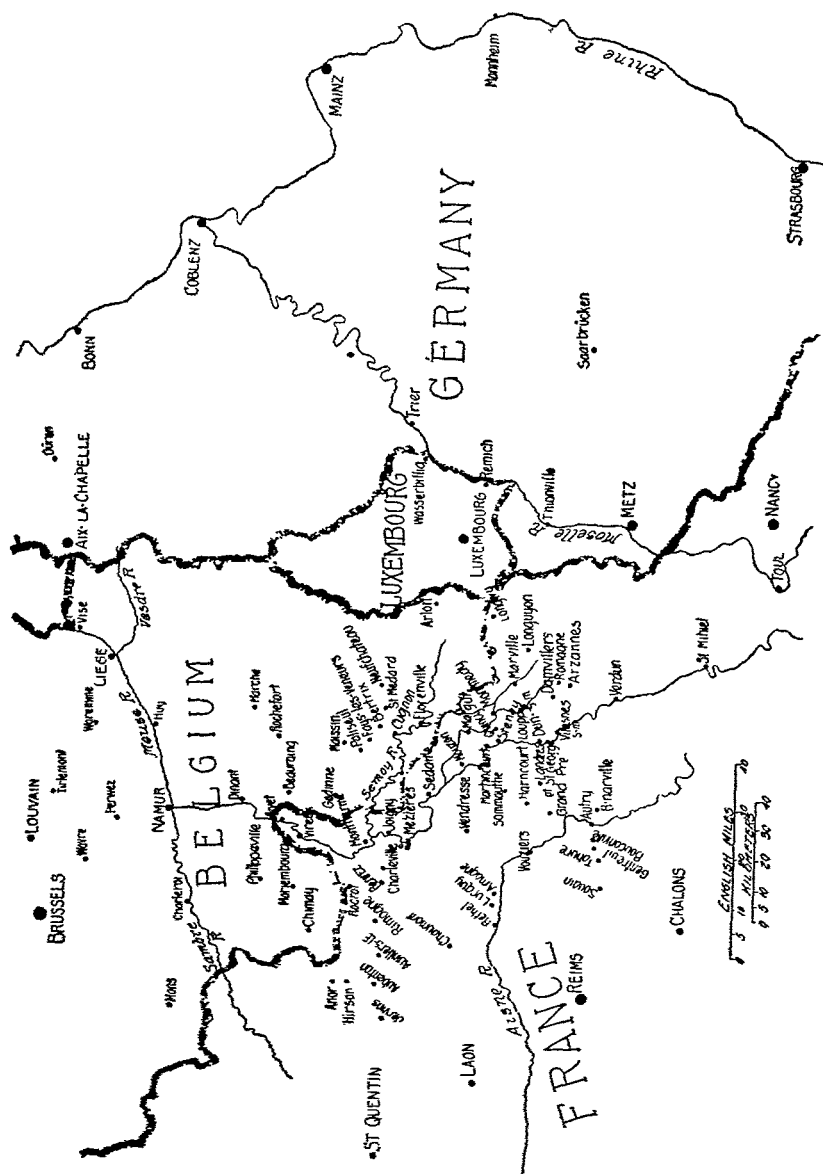
c. It is no less indispensable that the offensive of the Fifth Army should be supported by a simultaneous offensive by the army which is to come up on its right.

The offensive of the Fifth Army in the direction of Neufchâteau is provided for the eventuality (which moreover is probable) in which the German right wing is directed on Sedan. But it may happen that the right wing will be directed much farther to the north. That depends entirely on the breadth which the Germans wish or are able to give to their turning movement through Belgium. In recent German military studies, notably the Kriegspiel played by the great General Staff in 1911, they have readily conceived of crossing Belgium with three armies, of which the most western was directed toward Dinant, in such a manner as to cross the Meuse between Givet and Namur.

Moreover, the obstacle of the Meuse is doubled between Mézières and Givet by a formidable wooded barrier, with a depth of more than a day's march, where no army would enter an engagement if it knew the exits to be guarded. From this it follows that the army on the right of the German right wing can be directed only upstream from the barrier, that is, on Sedan, or down stream from it, that is, on Givet or farther north.

It is clear that once the Fifth Army is engaged in the direction of Neufchâteau, it will not be able to meet that latter contingency, which is considered here only for the purpose of study.

General Lanrezac says that he called the movement of the German right against Sedan "probable" only because he knew that General Joffre considered it as practically certain; that he (Lanrezac) never did think this to be so, but thought the German right would be directed farther north. In other words, General Joffre thought the Germans would make



their turning move on the right bank of the Meuse, while General Lanrezac believed this movement would be made on the left bank. General Lanrezac was so certain of this wider turning movement of the Germans that this memorandum is more of a protest and a call for help than it is a statement of how he proposed to carry out the mission assigned him. He does not mention an advance toward Thionville.

From his statement it appears that he visualized an advance to the Semoy with all his corps in line; i. e., a parallel advance, covered by the Cavalry Corps. Such a form of advance would have had the advantage of getting the army through the Ardennes and across the Semoy more quickly; but would have lacked security while passing through that difficult terrain and flexibility of maneuver after the location and intentions of the enemy had been determined. In view of the fact that the G. H. Q. plan of campaign was not carried out, further comment appears useless. It is of some interest to note, however, that the Fourth Army, advancing in this area, encountered the enemy on the given line north of the Semoy on August 22 (the twenty-first day of the French mobilization) and fought the battle of the Ardennes on August 23 and 24. But if the French had advanced to the Semoy earlier, it is probable that the Fourth German Army would not have held back, waiting for the First and Second Armies to make the turn through Belgium.

COVERING FORCE

The organization and disposition of the covering forces for the entire concentration was provided in the War Plan (Plan XVII) and remained under G. H. Q. This plan divided the frontier into five sectors, that which concerns the Fifth Army being the Western Woevre, to which was assigned the II Corps and the 4th Cavalry Division. The covering troops, which moved by marching, proceeded to their positions on July 31. The 4th Division, stationed in time of peace at Charleville, Mézières, Sedan, and Stenay, was deployed along the heights east of Ire-le-sec, facing the Marville gap. Six companies at Azannes assured connection with the adjacent sector and with Verdun. The special mission of the 4th Division was to protect the detraining points along the Meuse north of Verdun and to prevent Verdun from being enveloped from the north. The Fifth Army commander was directed to complete the bridgehead of Montmédy by later using his reserves on the heights north of Montmédy from the woods of Ceranvaux to Saint Walfrey. The 4th Cavalry Division, which has been stationed at Mézières, Sedan, and Longuyon, moved to the region between Montmédy and Longuyon and covered the left of the 4th Division. The 8th Infantry Brigade (commanded at this time by General Mangin) moved brigade headquarters from Laon to Mézières; its 45th Infantry from Laon and Hirson to Mézières and Sedan to guard the crossings of

the Meuse between Sedan and Joigny; its 148th Infantry from Givet and Fort Charlemont were to guard the crossings between Vireux and Givet (inclusive). The Cavalry Corps, concentrating in the vicinity of Mézières, was charged with guarding the crossings between Joigny and Vireux. The 8th Brigade was attached to the Cavalry Corps on August 5.

The advance echelon of II Corps headquarters moved from Amiens on July 31 to Louppy-sur-Loison and took over the command of the sector on August 1 (M minus 1). The 3d Division, which was stationed at Amiens, Peronne, St. Quentin, and Bouvais, at 6:00 p. m., July 31, received the order to hold itself ready to move to join the remainder of the II Corps and, after completing its mobilization, moved by rail to Stenay, Baalon, Mouzay, and Dun-sur-Meuse, with the mission of covering the withdrawal of the 4th Division, if that should become necessary. A few days later, the units at Dun-sur-Meuse were moved to the vicinity of Baalon to be in a better position for the mission assigned the 3d Division.

In the first order for the movement of the covering troops, dated July 30, the Minister of War established a line through Murville—Fillières—Morfontaine—Hussigny, from eight to ten kilometers from the frontier. For diplomatic reasons, i. e., the effect on possible allies, it was forbidden that any French soldier or unit should pass that line. This order was repeated and emphasized on August 1 and on the second the line was extended to the west at a distance of from two to five kilometers from the Belgian frontier. On August 2, German troops were reported at Longlaville and at various points along the fronts of the other armies. It was also reported that the Germans had entered Luxembourg that morning by the bridges at Wasserbillig and Remich. The interdiction against crossing the given line along the German frontier was lifted on the evening of August 2 (M day), but troops were not permitted to cross the frontier and the restrictions along the Belgian boundary were repeated, the line being drawn back from Hussigny to Haucourt and Hesserange. Not until August 5 (M plus 3) were French troops permitted to enter Belgium.

There are three means of providing protection for a concentration:

- a. Actual defense by means of fortifications, natural barriers and covering troops.
- b. Rapidity of mobilization and concentration.
- c. Distance of the concentration from the enemy's frontier.

In this case, Belfort, Epinal, Toul, and Verdun provided a fortified line behind which the concentration of the French armies was to be effected and practically fixed the line of the Meuse as the main line of defense for the covering troops in the sector of the Fifth Army. From the eastern limit of the zone of concentration to the Meuse is about fourteen miles; from the Meuse to the heights on which the 4th Division was deployed is

about nine miles; from these heights to the German frontier is about twenty-seven miles; making a total distance from the zone of concentration to the frontier of about fifty miles.

Such a disposition and the prohibition on the covering troops against crossing the line eight kilometers from the frontier, do not indicate an essentially offensive attitude; but, on the other hand, made it certain that in the first part of the war, at least, the conflict would be on French territory. The defensive rôle of the covering troops was further emphasized in Instructions to Covering Forces, published before the war. This attitude was forced on the French by the lack of a suitable barrier farther east, by diplomatic considerations regarding England and Italy, and by the greater speed and strength of the German concentration.

The number of troops used in the covering forces of the French armies (one corps from each of five armies) has been criticised by some writers (one-fourth of the entire force according to General Percin) as by reason of this excessive strength, revealing the plan of concentration to the enemy. So far as the Fifth Army is concerned, only one-fifth of its strength was used in the covering force and, since the 8th Brigade was attached to the Cavalry Corps to cover the left flank of the entire concentration, the strength does not seem excessive.

Theoretically, the position of the covering troops was studied in time of peace and some steps had been taken to provide for the organization of the position. Actually, little or nothing had been done along these lines. General Regnault, who commanded the 3d Division writes:

Is it then thus that the coverature has been conceived and prepared? When my division arrives, it is not to reinforce the line which the 4th Division has held for seven days, but to prepare a line of defense in rear. And that a defense of the Meuse, which my division is to insure. That defense has not been studied in advance. Why has not that study been made? Why do they leave it to me to improvise? Why is there no plan to indicate the dispositions to be taken, the work to be executed? And two months before, the Corps Commander wanted to send me on a reconnaissance in that region and the necessary credits were refused him.²

Here, I think, is a phase of our meditation on future wars in which one must consider particularly the "perfected materiel," especially the airplane and motor vehicle. The French had planes for observation in this area, but the bombing, pursuit, and attack planes had not been developed. The use of motor transportation for covering troops was on a small scale.

CONCENTRATION

On August 2 (M day) it was known that the Germans had crossed the French frontier at a number of places, had entered Luxembourg, and

²*Le 3me Division d'Infanterie.*

had demanded a free passage through Belgium. General Joffre, therefore, ordered the variant to Plan XVII put into effect. Under the provisions of this variant, the Fourth Army was to detrain a little farther north than provided for in Plan XVII, but still in rear of the Third Army, and then was to move up into line between the Third and Fifth Armies. It should be borne in mind that this change was ordered while the movement of the covering troops was still in progress and before the concentration proper had begun. The concentration of the combatant elements was begun on August 5 and was completed by noon, August 12; that of the other units was completed by noon, August 18. The changes caused by the variant in the concentration of the Fifth Army were comparatively slight. The southern boundary of the army area was moved north to the line, Binarville—Autry—Bouconville—Gratreuil—Souain (exclusive). New detraining stations and billeting areas were assigned, by G. H. Q., to the III, X, and XI Corps; each being a little more contracted than originally planned and those for the X and XI Corps being moved a little to the north. The area for the 60th Reserve Division, initially placed in the vicinity of Landres-et-St. Georges, was revoked and on August 6 announced as the vicinity of Amagne. The left group of reserve divisions was ordered concentrated (under G. H. Q.) in a more contracted area east of Laon. The 37th and 38th Moroccan Divisions, arriving from Africa, were directed on the regulating station of the Fifth Army at Laon.

Transportation to the concentration areas proceeded without interruption. Under the transportation plan accompanying Plan XVII, a definite line of railroad was assigned to each corps and separate division. The army artillery moved, after the corps, to the Vouziers area. Regulating stations in this part of the theatre were at Châlons, Rheims, and Laon, all connected by transverse lines. The application of the variant made necessary a readjustment of parts of the lines assigned to corps in advance of regulating stations, but the general scheme was maintained.

Putting the variant into effect and the consequent changes recited above did not complete the dispositions for the concentration. By the evening of August 7 (M plus 5), that is, about the time when the transportation of the troops to the concentration areas was reaching its height, the enemy situation as known to the French was as follows: Elements of five army corps had appeared in Belgium—three north of the Vesdre and two south thereof—covered by at least two cavalry divisions. A sixth corps had appeared near Gouvvy. The Germans had entered the city of Liège, but none of the forts had been taken. North of Liège they had crossed the Meuse at Visé. South of Liège the cavalry was moving toward Huy. Large bodies of cavalry had appeared near Marche. Luxembourg was occupied by the VIII Corps, with a cavalry division near Arlon. In Lorraine there were parts of six army corps, and other forces were still

farther south. On the right bank of the Rhine, particularly near Freiburg, were large concentrations.

In addition to the troops defending Liège, the Belgians had one division at Namur, with a detached brigade at Huy. The remainder of their army, four divisions, was assembled in an area about twelve kilometers on a side, between Louvain, Tirlemont, Wavre, and Perwez. Their cavalry division was at Waremmé. The Belgian plan was based on the defense of Antwerp, which prevented their army from joining the French in an offensive operation.

The British Expeditionary Corps could not enter the line until its concentration around Mons was completed and transportation of the troops from England was not to start until August 9.

Based on this situation, General Joffre issued Instructions No. 1, the first since taking command of the armies in the field. Noting the five or six corps in Belgium and about six corps in front of the First and Second Armies, the part of the situation which struck him as most important was the force around Thionville and Metz, "so placed as to debouch towards the west or equally well placed to turn to the south in support of Metz." He announced his intention to seek battle, with all his forces united, supporting his right on the Rhine. The First Army was ordered to launch an offensive in Alsace; the Second Army, while covering itself from Metz, was directed to launch an offensive toward Sarrebrücken; the Third Army was ordered to be ready to act toward the north or to counterattack enemy forces debouching from Metz; the Fourth Army, to which was attached the II Corps (formerly a part of the Fifth Army) was ordered to hold itself ready to attack between the Meuse and the Argonne or to cross the Meuse north of Verdun.

The Instructions stated that the left of the armies would be refused, if necessary, to avoid an engagement which might be decisive for one of the armies before the others were in a position to support it; but that there might be time to push the left flank forward if the Germans should be delayed in front of Liège or should turn south. The Fifth Army was ordered, therefore, to close up between Vouziers and Aubenton in such a manner as to be able to launch an attack in force against any troops crossing the Meuse between Mouzon and Mézières, or, if required, to cross the Meuse between those points.

The Cavalry Corps was directed to cover, primarily, the Fifth Army and, in case it had to cross to the west bank of the Meuse, to hold itself in the region, Mariembourg—Chimay, to protect the junction of the British Army and the Fourth Group of reserve divisions. This group of reserve divisions was directed to move to the vicinity of Vervins and there organize a defensive position permitting it to debouch either to the east or to the north. Army commanders were directed to prescribe at once the prepara-

tory movements for the offensive in order to facilitate it and make it effective.

Referring to these General Instructions No. 1, General Joffre says, "An *Instruction Générale* like this is not an order which must be executed the following day. They are directives according to which those who are to carry them out, orient their dispositions. Directives of that nature may not lead to a battle until ten or twelve days later." Any greater precision would have been premature, since at the time when these Instructions appeared (August 8), "the movements for the concentration had commenced only on August 5th and would not be completed until August 18th."

This has some bearing on the question sometimes asked: "What is a directive?"

Based on these instructions, the Fifth Army commander assigned sectors of the Meuse between Mouzon and Mézières to each of his corps and directed that the bridges in those sectors be held and detachments pushed to important points beyond the Meuse. The concentration areas of the X and XI Corps were moved slightly north, because the right boundary of the army had been changed to the Souain—Tahure—Sechult—Grandpré—Buquenay—Harricourt—Sommauthie road (exclusive), to make room for the Fourth Army to gain its assigned portion of the Meuse.

Another change in the concentration of the Fifth Army was made on August 10 (M plus 8), when the I Corps was moved to the east. G. H. Q. had asked General Lanrezac's opinion as to whether or not, on account of the delay of the German deployment for battle, which was now assured, if the I Corps were moved to the region of Gedinne and organized a position there, it would not assure a crossing of the Semoy for the Fifth Army. General Lanrezac replied that he would place the I Corps in a position from which it would be able to reach Gedinne in one day's march if a general offensive were decided upon, but unless there was to be a general offensive, he thought a movement of the I Corps to Gedinne would be ill timed; and if there was to be a general offensive, such a movement of the I Corps was insufficient and that the Fourth Army ought to put itself in position to attack at the same time. To this General Joffre replied that an offensive movement by the I Corps alone would not be ordered, but would be made coincident with an advance of the entire Fifth Army and a part of the Fourth Army. The I Corps was moved on the tenth to the area extending from Rocroi up the Meuse as high as Monthermé, with headquarters at Renwez. Each of the other corps contracted their areas slightly toward the north. On the eleventh, the Cavalry Corps, moving from the vicinity of Rochefort to Maissin (about 20 kilometers south of Rochefort) uncovered the left of the Fifth Army, except for the 148th Infantry, which held the crossings of the Meuse from Namur to Dinant. If, as seemed to be indicated by patrols, there were large cavalry forces in the region east

of Namur—Givet, the line of communications of the I Corps was liable to be cut. General Lanrezac drew the attention of G. H. Q. to this situation and asked authority to move the I Corps to Givet. This was approved and the I Corps was ordered to move to the region between Philippeville and the Meuse. The Army Artillery completed its concentration in the general vicinity of Vouziers on the twelfth.

On August 10 the II Corps and a part of the IV Corps of the Fourth Army had been attacked by German forces of all arms at Mangiennes, resulting in the repulse of the Germans. On August 12 the menace of a German attack on this part of the front, which was thought to have been removed, still persisted. The commander of the II Corps reported that he expected an attack on the thirteenth. General Joffre, therefore, issued Instructions No. 6, in which he stated that the situation made it appear that the French perhaps would not have time to seek battle north of the Semoy under favorable conditions. In consequence, the Third Army was directed to be ready to counterattack toward Metz or to join, with its IV and V Corps, in the Fourth Army attack to the north. The Fourth Army was directed to push the heads of its main bodies on August 14 to the front: Dun-sur-Meuse—Sommauthé. The Fifth Army was directed to have the heads of its main bodies eight or ten kilometers from the Meuse in front of Mézières and up-stream therefrom, but to delay its attack until the enemy had engaged a large part of his force on the left bank of the Meuse. North of Mézières the crossings of the Meuse were to be energetically defended and authority was given the commander of the Fifth Army to destroy the bridges when necessary.

The Cavalry Corps was directed to hold itself on the left of the Fifth Army, but to cross to the west bank of the Meuse only when necessary. The 37th and 38th Divisions, detraining on August 13 to 16 in the region of Tournes—Auvelles-les-Forges and Anor—Hirson, were moved to the vicinity of Rocroi and Chimay, respectively, and placed at the disposition of the Fifth Army.

In case the enemy were distant, all dispositions were to be made by August 15 to be ready to move, on order, to the front: Beauraing—Gedinne—Paliseul—Fays-les-Veneurs—Cugnon (Fifth Army)—Tetaigne—Margut—Quincy (Fourth Army). Liaison between the Fifth and Fourth Armies was made by the 9th Cavalry Division (Fourth Army Cavalry) which was moved to Martincourt to hold the crossings of the Meuse below Montmédy. The Fourth Army began to cross the Meuse on the fifteenth (M plus 13), which date marked the beginning of preparations for the movement of the Fifth Army to the Sambre and the completion of the period of concentration.

These minor changes in the concentration of the Fifth Army have been recited here for the purpose of emphasizing the fact that the initial

concentration of an army is not the completed concentration, and that the completed concentration is not a matter of a few hours or a day or two; in this case it covered a period of nearly two weeks. During this period, General Joffre repeatedly announced that it was his intention to assume the offensive. The objective of that offensive was to be the German armies, whose strength, location, and intentions were unknown and were incorrectly estimated by French G. H. Q. throughout the period of concentration. The Germans began their advance on the second of August (French M day), while the left wing of the French armies practically stood still until the fourteenth day of mobilization. The Germans had the initiative and the French were forced to follow the enemy's lead and to make a number of changes in their Plan of Concentration and Plan of Campaign to meet the changing situation. This concentration illustrates, then, the changes in plans which may be forced on a country by an enemy, who, by reason of being better prepared, is able to seize and hold the initiative. In other words, it illustrates the necessity for well-conceived and well-prepared plans, supported by the necessary means for carrying out those plans and forcing the enemy to follow our lead. In any case, the plans must be flexible.

One of the striking things concerning this period is the detail with which G. H. Q. gave orders to the army and the consequent lack of initiative left to the army commander. G. H. Q. prescribed the areas and movements of each corps and separate division of the army and the army orders were little but a repetition of the G. H. Q. orders. After the troops had been detrained, it seems that it would have been better had G. H. Q. given the army a mission and an area and then allowed the army commander to arrange his corps within the given concentration area.

In view of the indefinite situation, a more flexible formation of the army in its concentration area would have been advisable. Not only were all the armies in one line; but in the Fifth Army, all corps, except the covering corps, were concentrated in one line. The following solution is suggested: the I Corps in the region of Rimogne; X Corps, Vendresse; III Corps, Chaumont—Porcien; XI Corps, no change; 52d Reserve Division, Aubenton; 60th Reserve Division, Lucquy; army artillery, no change. Concentrated in this way, the army would have been in a more favorable formation for a movement east toward Thionville, to the northeast toward Neufchâteau, or to the north toward Namur, with from one to three corps in the front line in each case. Such a concentration would have provided protection for the Meuse at an earlier date, would have provided for the protection of the left flank of the armies, as directed by G. H. Q., and would have facilitated the march to the north, which was the movement finally made by the army after the concentration, even for the initial detraining areas.—[*To be continued.*]

The Policy of the Coast Artillery On Small Arms Equipment and Training

By CAPTAIN WILLARD W. IRVINE
Coast Artillery Corps

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IT is the purpose of this paper to examine the basis for the policy of the Coast Artillery on small arms equipment and training and to test its application to present conditions. The present policy may be thus stated:

a. Equipment:

- (1) Harbor defense and railway artillery regiments are armed with the rifle.
- (2) Antiaircraft and tractor artillery regiments are armed with the pistol.

b. Training:

- (1) A minimum of eighty per cent of the personnel qualified as marksmen, and not to lower the standard upon which qualification is based.
- (2) The entering each year of a Coast Artillery team in the National Rifle Association's Matches at Camp Perry, Ohio.

Every efficient organization has certain policies. We may then ask: On what is any policy based? It is based on the object to be obtained, and the conditions which must be met in accomplishing that object. It follows that any policy of the Coast Artillery must be based on its mission and the conditions to be met in accomplishing that mission.

Let us, therefore, examine the mission of the Coast Artillery in order to determine its requirements with reference to a small arms weapon. We turn to par. 15, TR 10-5, and find, briefly, that the mission of the Coast Artillery is to fire against moving targets—on land, on water, and in the air. All else is incidental, and every policy should directly aid in the accomplishment of this mission.

Since our mission only requires the service of certain types of artillery, and not the protection of this artillery from capture, it appears that neither technical nor tactical considerations require a small arms weapon. Why then is such a weapon required? It is because it is necessary for disciplinary drill, for guard duty, and for personal safety.

What weapons best meet these requirements? It is one that is light in weight, compact, easy to care for, and effective for guard duty. The rifle does not meet all these requirements. The pistol does.

Turning now to the present policy of the Coast Artillery we find antiaircraft and tractor regiments are armed with the pistol but railway and harbor defense regiments are armed with the rifle. Let us, then, examine some reasons advanced for arming a coast artilleryman with a rifle.

a. To protect the fort, or the guns manned, or both.—Our present tactical doctrine considers the fort as a part of a sector or sub-sector. The mission of the Coast Artillery is no longer an independent one. Whether the antiaircraft and heavy artillery be fixed or mobile, the coast artilleryman's mission is to man it, not defend it.

b. For guard duty and for personal protection.—A soldier requires some small arms weapon. The pistol has all the advantages for guard duty and personal protection of the rifle and many others. So the rifle is not necessary for this purpose.

c. For riot duty.—The coast artilleryman will seldom be called for this duty. When he is, the shot gun, the riot stick, and the pistol will serve the purpose better.

d. To prepare him to serve as infantry.—The Coast Artillery was once considered an independent arm. The "mobile army and the coast artillery" was the way the Field Service Regulations stated it. As an independent force, coast artillerymen were trained, like infantrymen, to defend their position. The rifle had, therefore, a prominent part in the training of coast artillery. The National Guard was then poorly trained; the Organized Reserves did not exist.

Do those same conditions exist today? We are now tactically a part of the Army whatever the type of artillery we may be manning. The National Guard is no longer, as a German observer once declared it, an organized mob. Under the present system of federal aid, they have developed many well-trained organizations. Recently a National Guard Coast Artillery regiment arrived at night at a Regular Army post after two days on a boat. Trucks rolled off, and men marched off with precision. Officers and men knew what was expected. In a few days, using 3-inch antiaircraft guns, they shot down an aerial target with the abandon of Regulars, and with machine guns made fifty-six hits in five thousand rounds on a similar target.

Reserve regiments have made such progress in the four years of their organization that few not detailed on this work have any adequate conception of their efficiency. There are many Coast Artillery Reserve regiments where more than fifty per cent of the Officers are pursuing difficult courses in Gunnery and Tactics. Yesterday they were paper organizations; today the General Staff, after observing Reserve regiments functioning in command of Regular Army regiments, has classified some as highly efficient.

e. For disciplinary drill.—For this purpose, the pistol has proven with tractor and antiaircraft regiments as satisfactory as the rifle. In fact, in an infantry drill contest for the entire Hawaiian

Department, a coast artillery platoon armed with the pistol won first prize. Former prejudice in the Coast Artillery against the pistol for close order drill has almost entirely disappeared.

This leads to the conclusion that the harbor defense and railway artillery regiments should be armed with the pistol, the same as antiaircraft and tractor artillery regiments.

Having, theoretically, equipped all the Coast Artillery with the pistol, we next take up the question of the amount of small arms training required by its mission. If it is granted that the only function of the small arms weapon for a coast artilleryman is for disciplinary drill and guard duty, it follows that expertness in its use, while desirable, would aid little if any in the accomplishment of our mission. On the other hand, if the mission is difficult, if the training time is limited by such necessary duties as summer camps and heavy fatigue, then the time given to training with a small arms weapon is a positive hinderence to the accomplishment of that mission.

We proceed, therefore, to consider the difficulty of the mission and some conditions which must be faced in its accomplishment. There are many problems to be solved in railway and tractor artillery. We have hardly begun to explore the possibilities of antiaircraft artillery. Effectiveness of fire is dependent largely upon volume. The data must be turned out almost instantly, and guns must be fired with great rapidity. A battery of 3-inch guns must fire sixty rounds per minute. This requires long and skillful training. Certainly the difficulty of long-range fire against moving naval targets need not be proven, nor has a satisfactory solution of this problem been found. In general, the target practice reports indicate a none too high state of training. According to a War Department Bulletin, only nineteen per cent were rated above satisfactory and nearly ten per cent were unsatisfactory.

In addition, three months each year is given over to work on summer training camps with the National Guard, Organized Reserves, Reserve Officers' Training Corps, and Citizens' Military Training Camps. This is one-fourth of the training year and one-half of the outdoor training season from April to October, when weather permits most to be accomplished in artillery work. The War Department has stated that only two months will be given over by Regular Army troops to summer camps. Here is, however, the 1926 summer schedule for a Coast Artillery post of two regiments, whose total strength is about 800:

- a. Reserve Officers' Training Corps Camp,
- b. Citizens' Military Training Camp,
- c. Five National Guard Regiments,
- d. Three Reserve Regiments,
- e. One Reserve Battalion.

In this case, post facilities, as well as the number to be trained, prevent the summer training period being reduced to less than three months. Granting that the War Department ideal of only two months may be attained in time, the fact that this important work must and ought to be done by the Regular Army should lead the Coast Artillery to a realization of the necessity of cutting out non-essentials so that the meager six months of good weather, divided as they are by an interruption of at least two months for summer camps, may be spent in training for that mission for which we alone exist.

Having shown how difficult is our mission; how the time for training is limited to about nine months, six of which are unsuited to outdoor artillery training; having taken cognizance of the heavy fatigue required (which was the principal cause in one Corps Area this year of two thousand desertions from twelve thousand men); we proceed to examine the present policy with regard to small arms training. This policy requires:

- a. That a minimum of eighty per cent of a battery qualify as marksmen with their small arms weapon.
- b. That a Coast Artillery team be entered each year in the National Rifle Association's Matches at Camp Perry, Ohio.

What is the result of this policy? Regimental commanders take six weeks to three months of the year and spend it on small arms training. The time for this training, like that for the summer training schedule, must be cut out of the heart of the training year. Last year only ten regiments out of thirty-three succeeded in attaining the minimum standard of eighty per cent of the personnel qualified as marksmen, and the War Department in a Bulletin dated May 21, 1925, stated: "Some of the units which did attain this standard fired such a small percentage of the personnel as to be considered unsatisfactory." While small arms training is not the sole cause for the slow progress by the Coast Artillery in artillery work, it is one of the principal ones. It is taking about twenty-five per cent of the training year and fifty per cent of the best artillery weather, after the time for summer camps is deducted. *Can we spare this time on a non-essential which contributes nothing towards the accomplishment of the mission of the Coast Artillery?* Small arms training has been emphasized to such an extent that regimental commanders are cited in an official order from the War Department for failure to reach a minimum standard of eighty per cent of personnel qualified as marksmen. (See Coast Artillery Bulletin, War Department, May 21, 1925.) In the meantime, we are on the defensive in artillery matters—our only mission—and from the battery commander's report on artillery target practices to the report of the Chief of Coast Artillery we find an apologetic strain. We blame the poor results on the materiel, on the poor recruits, on the weather, on the

lack of time, and other things. We try to compete with other branches in their mission and with their weapon and let our own mission suffer.

Finally consider the policy of entering each year a Coast Artillery team in the matches of the National Rifle Association at Camp Perry, Ohio. In this connection, the following is pertinent:

a. Forty per cent of the entire mileage allotted to the Coast Artillery Corps is used by this team.

b. It is estimated that the team requires the services of twenty-five officers and men, mostly officers, on an average of five months; counting from the time they leave their home station until they return.

c. While our record is creditable since we entered the matches in 1919, the best we have done is third place. This year against five other service teams we finished seventh; a National Guard team finished sixth.

d. We are trying to beat the Infantry, Cavalry, and Marines with *their* principal weapon.

But we are told this is fine advertising. After all, will it be very good advertising to beat, if we ever do, the Infantry at their own game? The kind of advertising we want is the record from firing heavy and anti-aircraft artillery.

If we would go after a record with our principal weapon as hard as we are going after a small arms rifle record, would it not be better advertising—at least with Congress and the American people? They are appropriating money and paying taxes for us to train for one mission, and it is rather difficult for them to connect this mission with small arms firing. We do not need to break an Infantry or Marine Corps record; we need to improve each year the Coast Artillery record of the past year. When we accomplish this all other things will be added unto us. Success in our mission means complete victory.

CONCLUSION

We have not solved the long-range problem with heavy artillery and there are forty-eight new 14-inch 50-caliber guns awaiting the solution. There has been opened up to us a new field in antiaircraft gunnery that offers great possibility, and recent tests at Fort Tilden, New York, have shown what can be accomplished by intensive training. Our corps has been greatly reduced in strength in the last ten years, which has increased the difficulty of solving these problems. Our training schedule is too crowded. Our present state of training is unsatisfactory. Our morale is low. Every energy must be applied to the solution of these problems—our only mission. The first step in this solution is to adopt the policy of arming all Coast Artillery regiments with the pistol and reducing small arms training to the minimum.

The Influence of Aviation Upon Coast Defense

By MAJOR WILLIAM T. CARPENTER
Coast Artillery Corps

THE functions of fleets, fortifications, and aviation and their relations to each other in coast defense have unfortunately been confused in the public mind through the controversies waged largely by enthusiastic partisans of aviation during recent years. This is leading to jealousies and estrangements where a whole-hearted cooperation is essential.

History is again repeating itself, and the Navy is once more forced to defend the position of the battleship. First it had the torpedo boat which was to doom the battleship, then the destroyer and submarine, and now the partisans of aviation claim that aircraft has doomed the battleship and relegated the guns of our harbor defenses, including anti-aircraft artillery, to the scrap heap.

Though the public mind, untrained as it is in military and naval matters, may be confused in regard to the true status of aviation, it is believed, however, that the thinking people of our country will always realize that, for national defense, we should have all types of ships, guns, aviation, and other means of defense possessed by the leading nations of the world.

The life of a maritime nation, such as ours, depends upon land and sea forces for national defense. Each of these forces has a special function in the common mission of defeating the enemy during war. Their functions separate more or less along the seacoast and become more clearly defined as their activities extend away from the shore line. Each is vitally interested in aviation since it can operate over both land and sea.

The influence of the sea has entered largely into the life and history of all great nations past and present. Through sea power maritime nations rise or fall, and without free access to the sea no peoples can obtain or hold their share of the fruits of civilization.

Our civilization has conquered the dangers of the sea, and the ocean borne commerce of the world waits neither the whims nor variants of wind or tide. The protection of this commerce at sea depends upon the capital ship of the Navy, which, through its own self, possesses power to dominate the elements and can keep at sea for long periods during all conditions of weather.

The world is now confronted with the possibilities of aviation, and the question of the freedom of the air, with its many complications for bordering nations, now ranks second to the old problem of the "freedom of the sea." Already it has its commercial and military aspects. Aviation will not, however, reach a stage of independence in relative importance as

a means of transport until it conquers the perils of the air to the same extent that marine shipping has overcome the perils of the sea.

The vulnerability of aircraft to weather has been most strikingly brought out by the various investigations of the past year. The partisans of an independent Air Force have contended that only experienced aviator-meteorologists are competent to order flights of aircraft and their testimony along this line indicates that aviation is not, as yet, an every day, every hour utility, adaptable to the constant and mobile demands of either commerce or war. Therefore, aviation must, through force of Nature, remain for some time to come an auxiliary means of defense.

The various trans-oceanic flights of airplanes, including the Round-the-World Flight, were greatly assisted and were made possible by naval cooperation. They have demonstrated that, in so far as the present is concerned, the United States is not liable to serious aerial attack from any trans-oceanic power who will not have command of the sea in war time.

There is, perhaps, no arm of the military service, other than the Air Service, that is better fitted to understand the powers or limitations of aviation than is the Coast Artillery. There is perhaps no branch of the service that has a greater feeling of admiration for the airman and no branch that feels the need for cooperation with the Air Service more than does the Coast Artillery which manned the heavy long-range artillery and the antiaircraft artillery in France. This branch knows full well the advantage of aerial observation of artillery fire. It fully realizes the destructive effect of heavy aerial bombs upon warships and land targets. It also knows that it is not an easy matter to bring down an airplane with the present types of antiaircraft guns and equipment. The Coast Artillery and the Air Service have a common mission in coast defense, and they should work and train together for their mutual development and efficiency. There is no time to be lost in debate as to whether one has supplanted or will supplant the other in coast defense.

Both artillery and aviation weapons have their limitations. Both have limitations as to range, and both are limited at times by weather conditions. Both the Coast Artillery and the Air Service must understand the functions of the Navy in coast defense and must be imbued with the idea and spirit of cooperation with the Navy at all times.

In considering the influence of aviation upon coast defense, we may liken the defense of the shore line to that of a deep defensive position in land warfare in which there are two battle positions or zones, the Navy occupying the outpost area, the delaying area, and the battle area of the first battle zone. The Battle Fleet forms the main line of resistance of this zone. The mission of the Navy is the tactical offensive when its strength and position permits and the offensive-defensive at other times. In case of defeat it retires to the second battle zone along the seacoast held

by the remainder of the naval forces and the land forces. In this second battle zone we have the fixed elements of the harbor defenses forming a series of strong points along the line of resistance.

An analysis of the situation requires some consideration of the functions of fleets, fortifications and aviation as well as the weapons of each.

THE NAVY IN COAST DEFENSE

Coast defense, in its limited sense, is not primarily a naval function. It is only incidental to the broad mission of a navy as the national instrument of sea power. Sea power means safety at sea for one's ships of commerce and the maintenance of maritime routes of communication and trade. As Bacon said: "He that commands the sea is at great liberty, and may take as much and as little of the war as he will. Whereas those that are strongest by land are many times nevertheless in great straits." Mahan said: " * * * the necessity of a navy, in the restricted sense of the word, springs, therefore, from the existence of a peaceful shipping," and again, " * * * if the defense of ports, many in numbers, be attributed to the navy, experience shows that the navy will be subdivided among them to an extent that will paralyze its efficiency."

The mere protection of our shores, either by ships, armies, or aviation, against foreign aggression will not give us the freedom of the seas for our commerce. Our commercial frontiers must extend to all the ports of the world. And we may safely assume that until overseas commerce is carried by aircraft that the freedom of the seas will depend, as in the past, upon strong battle fleets capable of keeping the sea under all the adverse conditions of weather that cargo carriers must endure at sea. The battleship must continue to be the mother ship of sea power. In addition to battleships, the well-balanced fleet consists of such auxiliaries as fast cruisers, destroyers, submarines, aviation, tenders, and trains.

The Navy has a secondary or local mission in coast defense. It is to control the local sea communications including the coast-wise sea lanes, keeping them open to domestic and friendly shipping, to deny them to enemy blockading forces and to raiding forces such as submarines, destroyers, fast cruisers, mine layers, and other types of naval vessels, and aircraft. To accomplish this the Navy employs submarines, destroyers, subchasers, mine sweepers, scouting and patrolling vessels, and various types of sea-going aircraft based on shore. For this purpose such elements of the naval forces are attached to Naval Districts as will not impair the battle fleet in its mission at sea.

Here the Army and Navy meet on a more-or-less common ground in coast defense, and success depends upon close cooperation between the commanders of Naval Districts and the commanders of Defense Sectors, as well as between the various branches of each service.

THE ARMY IN COAST DEFENSE

Coast defense from the Army standpoint includes such dispositions and operations of the mobile forces of the Army as may be necessary to meet and repulse attack upon any portion of the seacoast. In this the harbor defenses play a most important part, since an invading enemy would require one or more harbors with facilities suitable for the needs of ships of deep draft, such as the large ships of the fleet, supply and transport ships.

On account of their great value to the enemy it is essential that our harbors be protected by permanent fortifications capable of immediate action at all times.

Harbor defenses. The mission of harbor defenses over the sea and land areas covered by their armament is to deny the enemy possession of the position and its utilities; to prevent destruction or serious injury by bombardment of the harbor utilities; to safeguard the shipping of various types within the harbor and to provide an area off the harbor entrance in which naval vessels and merchant shipping will be protected as far as possible against all forms of enemy attack.

The principal weapons employed are the guns of the primary and secondary armament, antiaircraft armament, and the controlled submarine mine. These require such auxiliaries as terrestrial observation stations, position-finding and fire-control equipment, listening apparatus, means of communication, machine guns, and aircraft.

Fortified harbors have great strategical value in that they increase the strength and mobility of the Navy by relieving it of the necessity for immediate defense of the coast, by assuring it of greater freedom of movement, and at the same time affording it safe bases from which to operate and upon which to retire for rest, supply, and repair.

Harbor defenses should be of such strength as to make attack by ships improbable or to require combined operations by land and sea to bring about the fall of the area defended. Their value in this respect is *enhanced* by their readiness for immediate action. Immediate readiness is obtained only by means of fixed armament, which has the advantage of firing from a permanent base with excellent facilities for service, fire control, protection of personnel, ammunition, communications and accessories, all of which can be prepared leisurely in peace-time.

The one great disadvantage of fixed armament is in its immobility. Its power is limited to the range of its guns and it cannot be moved for its own protection or for the reinforcement of other positions. If not concealed it is a fairly good target for aerial attack to which it is more vulnerable than to shell fire from the sea. However, this immobility is of great moral value since fixed armament serves as an assuring and permanent protection to the locality covered, and, as Mahan said, "Permanent

works, established in quiet moments on sound principles, have the advantage that they cannot be shifted under influence of panic."

The submarine mine is an important element of the fixed defenses, as no fleet will enter a waterway until its approaches have been cleared of mines. While enemy aviation will be most useful in locating mine fields and directing the operations of mine sweepers, friendly aviation will be equally as effective in their protection.

The mandates of economy at the present time limit the amount of fixed armament for harbor defense to the minimum requirements in the way of mines, guns of the most powerful types, and antiaircraft guns as a nucleus for the defense of important harbors. These are to be augmented at threatened points, or when attacked, by mobile armament, for which space and communications should be provided for in peace-time.

Fixed armament, to date, has been the most reliable and most economical form of harbor defense. The amount of it may now be reduced somewhat with railway artillery and the bomber available in quantity for its reinforcement.

The land forces will not be called upon to exert a serious effort in coast defense so long as the fleet can keep the sea in the face of the enemy fleet or can take up a strategic position along his route of approach to our shores so as to prevent his advance. Such a position involves the possession of a suitable base, either permanent or temporary, to meet the needs of our fleet.

Should we become involved in war with a coalition of naval powers able to operate strong fleets in both the Atlantic and Pacific, then the land forces must be prepared to defend one or both of our seaboard, as the battle fleet would not be divided and would from necessity confine its activities to one of the oceans until the enemy therein could be disposed of.

In the event of the defeat or isolation of our fleet the coasts would then be open to invasion and its active defense would then become necessary. An enemy ordinarily would not expose his capital ships to the fire of the long-range guns of the harbor defenses and would usually resort to landing operations at some place outside the range of fixed armament of the primary class from where he would launch his land and aerial forces in an attempt to capture a suitable harbor base by combined land, sea, and aerial operations. The final result of such an engagement would depend largely upon our strength in heavy mobile artillery and aviation.

AVIATION IN COAST DEFENSE

The missions of aviation in coast defense are reconnaissance; attack of enemy aircraft operating over and off the seacoast, landing parties, and vessels; assistance in locating and tracking targets and in observing and

directing the fire of batteries; protection of the defenses by means of smoke screens; and neutralization of enemy fire.

The means and weapons employed by aviation are observation, attack, pursuit, and bombardment planes; balloons and airships; machine guns, bombs, and gas; with such auxiliaries as communication and photographic equipment.

Aviation, due to its great mobility, is both a tactical and a strategical weapon of great importance to both land and naval forces.

From its simple land missions of reconnaissance and observation of artillery fire at the beginning of the World War it grew rapidly into a distinct combat branch of the armies with specific fighting missions.

The effect upon naval warfare has been equally as great. The airplane is now not only the eyes, range finders, and spotting instruments of the fleet, but aviation has added another weapon to increase its offensive power in combat, and one which at the same time has increased the dangers besetting the fleet in war.

The powers and limitations of both land and naval forces have been seriously affected by aviation—as they usually are by all mechanical inventions adapted to war. Aviation has affected the methods of war on land and sea in very much the same way, but it has not changed the underlying principles of war—one of which is the principle of unity of command. Due to its vulnerability to weather, its dependence upon safe landing fields ashore or carrier ships at sea, and its adaptation to the purposes of land and naval forces, aviation at the present time can be considered only as an auxiliary to the military and naval branches of warfare. The principles of simplicity and cooperation demand that there be no further division of our defense forces.

The advantages gained by the advent of aviation are compensated for by the disadvantages where opposing forces are of equal aerial strength. The disadvantages are felt in the need for greater mobility, concealment, and antiaircraft defense. The employment of aviation has not only complicated warfare, but has greatly increased the cost and horrors of war.

Aviation has affected both the strategy and tactics of naval warfare, and now the modern navy seeks both naval and air bases for certain forms of its operations. The protection of the airplane carriers of the fleet is a problem that will be of great concern in future naval operations and will have its effect upon the tactics of battle.

Aircraft will bring opposing fleets into contact much sooner in the future than in the past, and, due to the radius of action of aircraft, the tendency will be for naval combat to take place farther out at sea than in the past or else off the shores of neutral countries where the fleets may meet on an equality in so far as air power is concerned. No fleet will

attack an enemy fleet when it is near enough to the enemy's shores to be supported by a preponderance of his aviation based on shore. A weaker fleet may safely hover along its own shores (if they be isolated by wide stretches of water) when protected by an ample air force ashore, but at the loss of sea power to its peoples, as was the case with Germany during the late war.

When opposing fleets meet in weather suitable for launching their aircraft, the first phase of battle will be a struggle between the opposing air forces. The decision in this phase will naturally go to the side which succeeds in launching the preponderance of all power at the jump-off, regardless of the amount carried by the other side. After this will come the decision between the ships on the water, in which the surviving aircraft will play an important part.

The victorious fleet will then hesitate to advance within range of the shore aviation of the enemy unless it has aerial superiority and this means the ability to launch a superior air force in time to meet and destroy the shore aviation.

With a reasonable air force, military and naval, the United States will never suffer from an ocean-borne air force. An attacking air force must be based on shore, at some point outside the continental limits of the United States, and such a base can be established in war-time only by means of a naval superiority.

AVIATION AND ARTILLERY IN COAST DEFENSE

The influence of aviation upon the powers and limitations of artillery is general and is felt to no greater degree by artillery in coast defense than is the case with mobile artillery wherever employed. The net effect upon long-range armament in coast defense is mostly to the advantage of the defenses when employed against naval craft.

Before the advent of aviation the efficiency of seacoast guns depended upon and was limited by the available means for determining the position of naval targets and for directing and observing fire against them. Observation from terrestrial observing stations was the main reliance for this service, and this service was not all that was desired. Its efficiency depended upon the height of site of these stations, weather, and atmospheric conditions affecting visibility. The maximum range of effective visibility from ground stations, depending upon the clearness of the atmosphere, varies at times from nothing to about 25,000 yards under the best of conditions.

In night operations control of fire depends upon illumination of the target. The effective illumination of ships by searchlights depends upon

their location with reference to observing stations and guns as well as upon clearness of atmosphere and weather conditions. Their effectiveness varies from a few hundred yards at times to 15,000 or 20,000 yards under the best of conditions. Ships can be picked up on very dark nights with searchlights under conditions impossible for them to be seen from above.

The successful employment of aviation with coast defenses in reconnaissance and in observation of artillery fire depends largely upon radio as a means of communication with the shore. If the enemy can prevent radio communication the efficiency of aviation in these services will be greatly impaired and its value in fire control will be very little, as rapid and accurate communication between the airplane and the firing battery is required. Visual signaling will not be practicable at long range or when the plane cannot be seen from the shore.

AVIATION HAS INCREASED THE POWERS OF COAST DEFENSES

By reconnaissance. Aerial reconnaissance will extend to great distances off the coast, probably to a thousand miles if large airships are available. Distant reconnaissance affords prompt and reliable information by radio of the composition, strength, and activities of enemy naval forces approaching or operating off the coast. Formerly, this service depended upon information obtained by scouting vessels of the navy.

Close reconnaissance to a distance of a hundred miles is of great importance to the harbor defenses as it will give information as to the intentions of the enemy before he comes within range of the armament. As he approaches, the information furnished by aviation will permit of the identification of his vessels and the selection of the most important targets for fire, which is of great tactical advantage. Close aerial reconnaissance is a simple matter in favorable weather, since at an altitude of a mile the airman's horizon is about a hundred miles, covering an area of about thirty thousand square miles.

Captive balloons are valuable for constant observation in order to reduce the possibility of surprise, particularly by small raiding parties.

By locating and tracking enemy targets. Aviation can locate and track enemy targets at sea with fair accuracy, thereby permitting fire to be placed upon them at times when they will not be visible from terrestrial stations. This service is rendered by giving range from the guns, compass or other bearings, by the grid system, by the radio location method, or otherwise. These methods have not as yet reached their full development. Under favorable atmospheric conditions, the captive balloon, which can ascend and remain at an altitude of 4,000 feet during winds as high as thirty and thirty-five miles per hour, affords rapid and accurate observation up to a range of about 20,000 yards.

Satisfactory tracking of a target at sea and a satisfactory target practice at a moving target, with several hits at 14,000 yards, was held at San Francisco in 1920 by means of a horizontal base maintained by two captive balloons. This emergency method would be of great advantage in case of a low, shore fog or smoke screen in front of the guns and observing stations when airplanes were not available. However, this method is not so satisfactory in windy weather and will require special observing instruments for such an unsteady platform.

By observation and control of fire at naval targets. The airplane is the best means for observing fire at ships when the means ashore cannot be employed or prove inadequate. Acoustic methods will serve within limits when the airplane and other means cannot be used.

Aviation has increased the maximum range of effective fire by day from the maximum range of effective visibility of the terrestrial stations to the limits of effective range of the guns. The work of the aerial observer is just as accurate at the full range limit of the guns and permits of their use to the limit of range when warranted. This enables the armament to be fired effectively under all conditions of weather favorable to flying when the airman can see the target and at times when visibility from the shore is prevented by haze, low fog, smoke, or otherwise. Normally, airplane observation will not be employed at ranges less than 20,000 yards when shore facilities are adequate for that range. An observation plane will be required for each battery or group of batteries firing or for each target under a concentration of fire. This might prove a heavy demand upon the Air Service under certain conditions and one that could not be fully met.

By destruction of ships and neutralization of naval fire. By means of the bomber, aviation can carry the attack upon naval ships beyond the range of seacoast guns, and, as shown by the bombing tests against battleships in recent years, naval vessels are subject to destruction by this form of attack where the attacking aviation has aerial superiority. These tests also demonstrated that, though a naval vessel may not be destroyed, its fire is undoubtedly subject to neutralization by aerial bomb and gas attacks. The success of any attack by shore aviation against a naval fleet will vary with the relative strengths of the two air forces and the ability of shore aviation to withstand the attack of the naval aviation and anti-aircraft guns long enough to get over the vessels and deliver their bombs. Without aerial superiority over the naval aviation, little can be expected in the way of destruction of enemy ships.

By illumination of naval targets at night by means of flares. The illumination of naval targets by means of flares at times when searchlight illumination is not effective is a service that aviation can render that will

be of great value to the coast defenses. In this way the presence of enemy vessels and landing operations may be detected and fire brought to bear upon them in emergencies. The same results can be obtained by means of star shells fired from the guns of the defenses but this is not desirable as the volume of destructive fire of the armament would be reduced by such an employment of important elements of the defenses.

By protection of defenses by smoke screens. By means of aviation, smoke screens can be placed in front of an enemy fleet or land forces which will greatly reduce the effectiveness of his fire giving a distinct advantage to the shore defenses.

NAVAL AVIATION HAS EXTENDED THE LIMITATIONS OF COAST DEFENSES

By reconnaissance of the defenses. Reconnaissance by naval aviation affords the enemy an opportunity to locate gun positions, mine fields, fire control stations, utilities, and other important features of shore defenses and to direct his fire more intelligently at the opening of an engagement. This has increased the need for greater concealment of such shore installations.

By observation of fire. The efficiency of naval fire is greatly increased by aerial observation, resulting in greater losses to the shore defenses. This together with the danger of aerial bombing has resulted in a wider dispersion of batteries, guns, and auxiliaries. Guns are now located farther inland from the water, where the chances for concealment are improved, and more attention is now given to camouflage than was the case before the advent of aviation. Concealment and dispersion are the greatest factors in protection from naval fire and bombing from the air. This dispersion of the guns has increased the difficulties of fire control.

Aviation has greatly reduced the importance of small islands and restricted areas as sites for fortifications, since the amount of armament that may be installed on such places must be quite limited as compared to practices of the past, and again the antiaircraft defense of such places is more difficult.

By various forms of aerial attack. (1) Bombardment aviation: While the naval bomber is not as effective as the army bomber, since it is slower and carries fewer and lighter bombs, it is another element of danger to be countered. The naval bombardment aviation must operate under cover of darkness or under the protection of a force of pursuit planes superior to those of the defense. Each bomber must have two pursuit planes for protection. A fleet will carry bombers in limited quantity as compared to the bombers of army aviation that it may expect to encounter when it gets within flying radius of the shore. A fleet of twenty battleships with two modern airplane carriers would normally carry not more than fifty-six bombers. The airplane carrier of the latest

type carries about seventy-two airplanes, not more than one-fourth of which are bombers. It takes one and one-half hours to launch, and the same time to land, this number of planes. So only a part of them could be in the air at one time over a harbor defense since one and one-half hours are required for the bomber to reach an altitude of 10,000 feet at which height they must fly to be reasonably safe from antiaircraft fire. They have an endurance of five hours, or five hundred miles, and a maximum radius of action of not more than two hundred miles, in view of the times of assembling each flight after launching and the delay in landing.

The bomber must fly in a straight line at constant altitude and speed for at least three-fourths of a mile before the bomb can be dropped with accuracy. When once the plane is taken under fire the pilot must react to the same by a change of direction. He must then get in position out of the danger zone of the previous course and take up a new one before he can drop his bomb effectively.

(2) Attack aviation: It is to be expected that, under favorable conditions, naval attack aviation will be employed against the artillery of harbor defenses, particularly as a preliminary to a combined land and naval attack for the purpose of taking an important harbor. This form of attack would be delivered against all elements of the defense including gun crews, fire-control stations, searchlights, and other auxiliaries. Against such form of attack it is probable that a greater number of machine guns will be required than would be available with the troops of the antiaircraft defense. If so, the shortage could be met by equipping gun batteries, groups of fire-control stations, searchlight stations, and other elements with machine guns for their local protection.

By neutralization of fire. All forms of attack by naval aviation will tend to neutralize the fire of the guns of the shore defenses, regardless of weather or not the destruction of any part of the armament is accomplished.

By smoke screens. Naval aviation may lay smoke screens in front of the fleet for protection or may place them in front of the coast defenses, including observing stations, thereby rendering the armament useless unless shore aviation is available to direct and observe the fire against naval craft.

ANTIAIRCRAFT DEFENSE

Antiaircraft defense is a joint function of local aviation and antiaircraft troops, and, with a reasonable amount of each, a harbor defense will have little to fear from an aerial attack delivered from naval vessels. A fleet would first have to establish a nearby shore base before undertaking serious bombing operations.

CONCLUSIONS

The conclusions to be drawn from the above are:

(1) That the net effect of aviation upon coast defense has been to the advantage of the defense, since aviation has increased the power of shore armament over that of naval armament.

(2) That fixed guns of the primary armament, antiaircraft artillery, and submarine mines are the most dependable means for the defense of important harbors against naval attack.

(3) That observation aircraft and balloons should be permanently assigned to the defenses of our most important harbors.

(4) That the closest relationship should be maintained between the Coast Artillery and the Air Service in all training that affects their allied interests in national defense, with a view to obtaining the maximum development of power and a complete cooperation between these branches in all their joint functions in coast defense, particularly for the further development of antiaircraft defense.

Upton, in his book *The Military Policy of the United States*, shows that "armies do not make war," but, on the contrary, "wars make armies." If you look back and try to determine the causes of the recent World War, the Spanish War, the Civil War, the Mexican War, the War of 1812, the Naval War with the French in 1789, and even the War of the American Revolution, you will find that not one of these wars was caused by our military forces. We raised our armies after the *people* had declared war. Some fall back on the statement that Germany was prepared and that caused her to go to war. In the first place, Americans are not Prussians, and in the second place, it would be impossible to substantiate this statement. We have entered each foreign war when our national policies have clashed with those of our opponent. Our military forces have had nothing whatever to do with the formation of our policies.—*Captain L. M. Overstreet, U. S. N.*

The Capture of the Baltic Islands*

By BRIGADIER GENERAL J. E. EDMONDS

C. B., C. M. G., R. E. (Ret.)

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THE occupation by the Germans in October, 1917, of the islands of Oesel, Dagö, Moon, and Worms, which lie across the mouth of the Gulf of Riga, is well deserving of study as a model enterprise of its kind. The expedition was undertaken, according to General Ludendorff, in order to increase the desire of the Russian Army for peace: it was thought, "since very few people have any idea of time and space," that the blow would make a profound impression 200 miles away on the authorities in Petrograd. Further, an "amphibious" operation provided a little occupation for the German Navy, confined to its North Sea ports since the battle of Jutland. The inactivity of the fleets, Ludendorff states, had sapped discipline and favored the spread of revolutionary ideas. Minor reasons for the occupation of the islands were that they blocked the entrance to the Gulf and the approaches to the port of Riga (since September in German hands), and that the Russians had three important airdromes on Oesel, from which aviators occasionally sailed forth to scare the peaceful burgers of the Reich.

The islands are low-lying, flat limestone plateaus covered with a thin layer of alluvial soil, well wooded with pine trees, and with sandy beaches. Oesel is some fifty miles by thirty; its highest point is only 65 feet above the general level; it contains 8 large and 14 small lakes, as well as about 50 small rivers; it had 65,000 inhabitants. Its principal town, Arensburg, a collection of wooden houses with a ruined castle and two churches, with 5000 inhabitants, was a seaside resort well known to Germans. Between the islands of Oesel and Moon, which are separated by a shallow channel, is a stone causeway 3300 yards long and 13 feet wide on top.† Moon itself stands up more than Oesel and has a general height of 66 to 80 feet above sea-level. Dagö is flat and marshy, rising gradually towards the north to a height of 88 feet.

The islands were well defended by coast batteries, that at Zerel, the southern extremity of Oesel, having modern 12-inch guns, with a range

* Authorities: Ludendorff, *My War Memories, 1914-1918*, ii, pp. 506-508; Schwarte, *Der grosse Krieg, 1914-1918*, iii, pp. 323-330: iv, pp. 178-181; Rolf, *Um Riga und Oesel*; Immanuel, *Der Weltkrieg*, pp. 239-241; Stegemann, *Geschichte des Krieges*, iv, pp. 396-401; Klingbeil, *Küstenverteidigung und Küstenbefestigungen im Lichte der Weltkriegserfahrungen*, i, p. 11-15; *Baltic Pilot*, Part II.

† Thus Schwarte. Immanuel says 990 yards. The Admiralty Chart shows that the length must be at least 3000 yards.

that commanded the passage, the Straits of Irben, 16 miles wide, between Oesel and the mainland opposite. There were also extensive mine fields. The garrison consisted, apart from coast artillery, of some 25,000 men—a somewhat unnecessarily large detachment from the field armies—under General Ivanov, organized in two divisions. It appears to have been con-

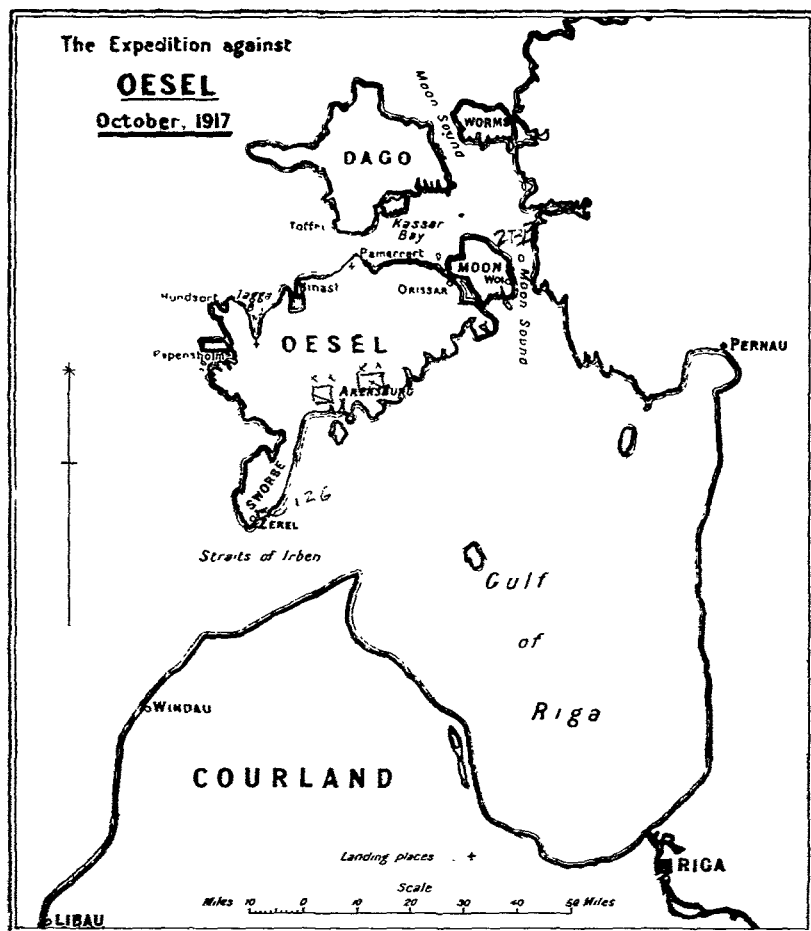


FIG. 1

centrated near Arensburg, with a strong detachment in the Sworbe peninsula. Although the troops had not actually mutinied, they had painted their buttons red and adopted the Soviet emblem. The Russian naval forces, known to the Germans by airplane reconnaissance, were a squadron under Admiral Zveschikov, consisting of two old battleships, and a number of cruisers, gunboats, destroyers, and torpedo-boats. They were assembled in the Moon Sound, between Moon and the mainland.

The supreme command (*Oberleitung*) of the German operations, naval and military, was placed in the hands of General von Hutier, commanding the Eighth Army, the troops nearest the coast. A special service Baltic naval command was formed under Vice-Admiral Ehrhard Schmidt (flagship *Moltke*), with Captain von Levetzow as chief of the Staff. It consisted of the III and IV Battle Squadrons, the II Light Cruiser Group, the I Group of torpedo-boat flotillas (Commodore Heinrich on the T. B. Leader *Bayern*). The III Squadron (Vice-Admiral Behnke) was formed of the *König*, *Kronprinz*, *Grosser Kurfürst*, and *Markgraf*; the IV Squadron (Vice-Admiral Souchon*) of the *Kaiser*, *Kaiserin*, *Prinzregent Luitpold*, and *König Albert*.

Seventeen merchant steamers, varying from 11,515 to 1,753 tons burden, with an average of 6000 to 7000 tons, were collected to convey the troops. They were to be accompanied by an airplane carrier ship, 2 colliers, an oil-tanker, a salvage group, 3 hospital ships, and a number of tugs and lighters. The total mercantile tonnage, which was assembled at Libau, some one hundred and fifty miles from the objective, amounted to 153,664. Although the advanced guard, 4500 men, was to be carried on the warships, this tonnage was insufficient to carry the rest of the contemplated expeditionary force in one voyage. Plans were therefore made to convey it in two echelons.

The military force consisted of the reinforced 42d Infantry Division (Lieut. General von Estorff) and a cyclist brigade (5 battalions, 3000 men), all under General von Kathan, with Colonel von Tschischwitz as chief of staff. In round numbers the total to be transported was 23,000 men, 5000 horses, 1400 vehicles, 150 machine guns, 54 guns (from 3-inch to 8-inch caliber) and 12 trench mortars, with provisions for thirty days.

The basis of the German plan was to secure the Moon causeway and cut off and capture the garrison of Oesel, and this done to deal with Moon and the other islands in turn. The entrance to the Gulf of Riga being closed by the Zerel battery and minefields, a landing-place had to be sought on the northern side of Oesel. A suitable one was found in Tagga Bay.† It was decided to make the main landing there and a subsidiary one of fifteen hundred men at Pamerrort, nearer Moon, whilst demonstrations were made, on the west side of Oesel, off the Sworbe peninsula and Papen-sholm. Should the main landing prove successful, a further landing of five hundred men was to be made at the southern end of the island of Dagö to capture the Toffri batteries. These and the Pamerrort defenses in German hands would open the waters beyond to the fleet, which would then support an advance from Oesel on Moon. It was also intended, as soon as the troops on Oesel had dealt with the garrison of the Zerel heavy-

* Formerly of the *Goeben*.

† Taggalaklet Bay on the Admiralty Chart.

gun batteries, to push ships into the Gulf of Riga to support the movement on Moon from the southern flank, as well as from the northern.

Airplane photographs showed that Tagga Bay was defended by batteries on either side at Hundsort and Ninast, and by entrenchments. It was further decided, therefore, that the landing must be a surprise, and take place at daybreak.

The first step was to neutralize the Russian naval squadron by blocking the northern exits of Moon Sound with mines and watching them with U-boats. The southern exit was also to be watched by submarines until German surface craft could arrive to deal with the ships.

The next step was to clear the course of the expeditionary flotilla as far as possible of mines. In spite of unfavorable weather at the end of September and beginning of October, by means of mine-sweepers and airplanes, this had so far progressed by the 8th of October that the beginning of the main operation could be fixed for the 11th of October.

The embarkation was carried out on the tenth at Libau. At midday the mine-sweeping flotilla and the landing party for Pamerrort left, with a number of mark boats with flares, which were to be laid out to show the route cleared through the minefields. A submarine was sent to reconnoiter Tagga Bay, and the passage there was also cleared.

The transports sailed on the morning of the eleventh; there was a good deal of rain, but the sea was perfectly calm, and, at 3:00 A. M. on the twelfth, all were anchored off Tagga Bay, only one hour behind time. The advanced guard of the landing party carried by the III Squadron, was got into the boats of the fleet, and assembled under cover of the I Torpedo Flotilla.

At 4:20 A. M. the ships took up position for bombardment, the *Bäyern* off Pamerrort, and the two battle squadrons off Ninast and Hundsort: in so doing two ships struck mines, but they remained in the line. The enemy batteries hardly fired, and the few that did soon ceased action. The Russians, it subsequently appeared, were nearly all asleep. According to prisoners' statements, they had been expecting the Germans for nine days; there had been an alarm every day, so that in the end no one believed in an attack. One Russian artillery commander when informed in bed that there were ships in the bay, replied that they must be Russian, turned over and went to sleep again. At his re-awakening, the Germans were in possession of his batteries.

The landing of the German advance guard at Tagga Bay began at 5:30 A. M.; it was a complete surprise and encountered little resistance. Photographs* show the troops embarking in boats at the ships' sides and being towed ashore, twelve boats, two and two, to a tug, as in the midst

* In Rolf's volume.

of profound peace, and without a ripple on the water. The advanced guard at once pushed on to seize the batteries.

At 6:45 A. M. the transports entered the bay, and at 8:15^{1-1^h} A. M. the disembarkation of the main body was begun, and continued without disturbance. By 10:00 A. M. the engineers had six light piers ready to land the men, but horses, vehicles and stores were put direct on to the shore from horse boats. At 11:00 A. M. a heavy pier was commenced, and by 3:00 A. M. on the thirteenth was 140 feet long, and by 4:00 A. M. on the fourteenth, 270 feet; but even this had only 6 ft. 8 in. of water at its head. The landing of stores was practically completed on the fifteenth, and was carried out at the permanent pier at Arensburg after that date, when the slight damage done there by the Russians had been repaired.

Eastward of the main landing, at 4:00 A. M.,^(1^{1^h}) a small naval detachment landed at the south extremity of Dagö, captured the coast battery of Toffri, destroyed the guns and re-embarked. The way was now clear, and at 7:00 A. M. a landing was begun at Pamerrort of an infantry detachment (apparently a "storm company") and two cyclist battalions. There was no resistance, indeed no enemy, and directly it was completed Cyclist Battalion I was sent south to cut the Arensburg-Orissa road, and the remainder pushed on to seize the head of the Moon Causeway, the infantry being conveyed on captured ponies and in carts. The escorting ships of the Pamerrort detachment proceeded into Kassar Bay, the water between Oesel and Dagö, and gradually drove back any Russian craft that appeared toward the Moon Sound.

The naval demonstrations against Sworbe and Papensholm were carried out, but did not provoke a single shot in reply from the Russians, and the Germans proceeded, apparently undisturbed, to clear away the mine-fields in the Irben Straits and open a way into the Gulf of Riga.

The 42d Division after landing at Tagga Bay pushed a detachment of three battalions, with two batteries, southward to secure the airdromes and wireless station at Papensholm, and then Sworbe peninsula and its batteries. Without waiting to land guns, machine guns, or trench mortars, the main body of the 42d sent a right flank guard of Cyclist Battalion III towards Arensburg, kept Cyclist Battalions IV and V on its left, and marched in two columns eastwards towards Moon. The detachment secured Papensholm, 500 prisoners and 15 guns, without resistance, on the morning of the thirteenth. It then sent a battalion to occupy Arensburg and, pressing on southward, received at 12:00 noon on the fifteenth the surrender of the garrison of the Sworbe peninsula, 28 officers and 1140 men, and secured the Zerel 12-inch battery. Meanwhile, III Battle Squadron, without waiting for this, had passed into the Gulf of Riga.

Attacked by the two German detachments sent from the north and west, Arensburg was also secured on the fifteenth.

The two cyclist battalions, and six battalions of the main portion of the 42d Division moving against Moon, its guns following, had to deal at first with a slight amount of resistance, but assisted by airplane reconnaissance easily overcame it. Spurred on by air reports of the situation, the leading cyclist battalion, marching on very bad soft roads, reached Orissar at the head of the Moon Causeway, at 8:30 A. M. on the fourteenth, and the leading infantry at 4:00 P. M., after marching 33 miles in 37 hours. They were almost too late. The Pamerrort detachment, which had got to Orissar late on the twelfth, had on the thirteenth captured first a number of officers and officials trying to escape to Moon in motor cars, and then an ambulance column and 130 wagons of officers' baggage, and had thus given warning of its presence. Later in the day, the detachment was attacked, and, running out of ammunition, was driven off, and the evacuation of the Russian baggage by the Moon Causeway was enabled to proceed. Supported on the fourteenth by the Tagga Bay troops, Orissar and the head of the Causeway were again occupied. On the fifteenth, when the whole of the German force had come up, it enveloped the Russians and drove them southwards against the coasts, where, caught in a small peninsula, 63 officers, 5,000 men, with 14 guns, surrendered, just two hours before ships appeared to rescue them.

On the sixteenth and seventeenth the Germans bombarded the defenses and approaches to the Moon Causeway both by land and sea. The Russian naval squadron, after losing a battleship and a cruiser, escaped northwards, where among the rocks of the Gulf of Finland and unknown minefields the Germans dared not follow it.* On the night of the seventeenth-eighteenth the Germans, after landing one company on the southwestern part of Moon to simulate an attack there, stormed the 3000-yards-long causeway at 12:30 A. M. on the eighteenth, the Russians again evacuating their position. By 3:00 A. M. the Germans had artillery across, and by 11:00 A. M. had secured a good bridgehead. A Russian general, 600 officers and 5000 men surrendered; others, including the "Battalion of Death," were seen to be attempting to escape to the mainland by boats, but, fired on by artillery, yielded about another thousand prisoners. The few remaining Russians on the island of Moon were then rounded up.

A naval party had landed on the southern end of the island of Dagö, on the fourteenth. During the day, and on each of the following days, it pressed forward into the interior of the island, but each night was re-embarked. On the eighteenth the party was joined by some cyclists, and on the night of the eighteenth-nineteenth, Moon having been secured, infantry was put ashore on Dagö. The island is very wooded; but the Russians offered no resistance, devoting their energies to burning anything

* A battery at Wol. on the eastern side of Moon, commanding the Moon Sound, seems also to have stopped the passage of the German ships. A landing party captured it on the seventeenth.

of value. By the twenty-first the whole of the garrison, 3700 according to one account, 1200 according to another, had been rounded up. The smaller islands were dealt with by the Navy, and all were in German hands by the 20th of October.

From first to last everything in the expedition went according to plan, and the Germans were never called upon to deal with an unforeseen situation. It will have been observed that although the operations involved both navy and army, they were placed under the sole command of an eminent soldier, and therein lies the novelty.

The various steps of the operation were fully thought out, and the parts to be played by the two Services carefully fitted into one another and well timed. Thus each secured the support of the other. The navy having cleared the way, made feints, and covered a landing, troops were put ashore to capture the batteries that were too powerful for the ships to engage or approach. Then the navy flanked the advance of the troops, and prevented the escape of the enemy by water after the troops had got possession of the only land exit. General Schwarte regards the operations as "most important and an event in military history momentous for the future"—what does he foresee? In any case there is nothing new for a main operation. One or two subsidiary attacks and one or more feints have for some centuries been the accepted strategic organization of a landing, passage of a river, or storming of a fortress or line of entrenchments, and have invariably succeeded when good arrangements have been combined with surprise.

We do not know from what source or in what manner pressure may be brought against us. But it is certain that to remain weak and unprepared in the face of such a situation is to invite aggression. It is, moreover, essential not only that we maintain a reasonable state of preparedness, but that it should be a matter of international knowledge that we are so prepared.—*John W. Weeks.*

Tactical Employment of Railway Artillery*

By LIEUT. COLONEL FRANK GEERE
Coast Artillery Corps

POST WAR DEVELOPMENTS. The field of activity of the Coast Artillery Corps has been materially broadened as a result of the developments in heavy mobile artillery consequent to the last war. To conform with the new situation, changes have been and are continuing to be made, based on a policy formulated at the beginning of the World War, if not before. The Corps has been reorganized into a series of regimental units, each allotted to a specific class of artillery. The units and subordinate groupings comprising the permanent fortifications have been re-designated so as to provide a similarity of terms in the operations of any regiment, whether in field or coastal warfare. Naturally, also, our training regulations have had to be re-written to satisfy the requirements for the employment of a regiment in either principal role.

Before the war, the heavy artillery arm was limited to fixed armament, which again was restricted to the defense of harbors. It comprised a series of companies with no other organization except as they formed a part of some tactical group in the fixed defenses of whatever harbor they happened to be stationed in, which were under the immediate administrative control of a "post commander." Notwithstanding this limited character and local role, the aggregation was called the Coast Artillery Corps, a title it could not live up to.

As a result of the war, the developments in heavy mobile artillery and development of specific classes of such artillery, with their auxiliary elements, has made it possible for us to become a "coast artillery" corps in fact, in which the fixed batteries and mining units have a part function only. So today we find ourselves a corps of regimental, specialized artillery units, with individual missions according to their class—regiments of harbor defense artillery, railway, tractor, and antiaircraft artillery. A spade is no longer called a shovel—the fixed defenses of a seaport are now its "Harbor Defenses"; other locations to be defended are called "Beach Defenses," which together are grouped into "Defense Sectors" within "Frontier Commands," the whole comprising the coast defenses. The fire command disappears and the tactical control point of any unit becomes its "command post"—fort, group, battalion, or battery—whether in fortress or field warfare.

* Text of a preliminary discussion given at the Unit Training Camp of the 601st Coast Artillery (Ry.) at Fort Andrews, Mass.—Ed.

Thus our arm is now organized and, in a great measure, developed so that it may truly fulfill its primary rôle of coast artillery and, in combination with the other land forces, defend the critical strategical parts of our seaboards.

POSITIVE SYSTEM OF COAST DEFENSE. This is what we speak of as a "positive system" of coast defense. Formerly the governing idea was the strong fortification with fixed artillery of the principal ports, harbors, and navy bases against naval forces, to prevent their occupation and use as enemy bases, or the bombardment of and raids on adjacent centers, terminals, and utilities, or the seizure of a port as an entering point for invasion. Those fortifications were isolated strong points, to be defended by our field forces from attack in rear by enemy forces that might have landed elsewhere. There was a division—that is, very little overlapping or blending—in the operations of the mobile and fixed elements; when the fixed armaments could be used rearward to support the mobile forces, they practically only "cooperated"; nor was there any definite provision for blocking a landing in force at favorable points between the chain of fortified harbors. It was merely considered at that time that it was not feasible for an enemy to put a strong force across the ocean and upon our shores in an effective manner, and that any lesser force would be deterred by the prospect of confrontation by much superior field forces after landing, to make achievement of the final objective impossible, especially with no real base—the Battle of Bladensburg in 1814 notwithstanding.

Two things have altered that aspect. The World War demonstrated that with modern facilities a large force could be transported to our shores, establish a temporary base on the coast, and be supported in the consolidation of an occupation, for which Gallipoli has furnished valuable lessons in spite of its failure. Second, heavy artillery has evolved from the domain of purely fixed armament to an effective mobile state, where it becomes available in opposing landings in force along the coast generally as well as to supplement the harbor defenses, or for special missions with a field army in land operations elsewhere. Hence a definite scheme has become both requisite and possible for covering all favorable landing places between the fortified harbors within critical strategical areas, and the division between mobile and fixed defense practically disappears and a positive system of coast defense takes the boards, in which railway artillery plays a potent part.

ADVANTAGES AND DISADVANTAGES. Its flexibility as well as mobility gives railway artillery a decided advantage over fixed armament for heavy artillery purposes. Not only can it be moved from place to place with relative speed, but its units may be distributed or concentrated as situations may require. It broadens the field of activity and increases the

initiative of the heavy artilleryman. Its rôles are extended, since it may augment the fixed harbor defenses or provide defenses for sections of the coast where the cost of fixed installations is prohibitive, or else serve as a high power reserve for a field army. Because of its mobility, the enemy may not know the actual location of units prior to the attack, and it is less vulnerable to sustained bombardment because, if located, it can change position during a lull in the attack. It saves the cost and labor of elaborate emplacements, as it depends for protection on the concealment afforded by mobility, camouflage, or natural terrain. Finally, its guns and carriages can be easily and quickly transported to an arsenal for re-lining or repair while another unit substitutes, as compared with the weakening of a fortification by the labor and removal of one of its elements.

On the other hand, railway artillery has certain definite disadvantages. Its cannon and carriages are restricted to conform with the loads and spacings required for safe passage over commercial track and the usual railway structures. The armament must have its overhead and side clearances so as to be within the limits of the international clearance diagram. Its field of activity is limited to localities where railway tracks exist or to which they may be extended readily in an emergency. Finally, to be used in coast defense operations it must be emplaced in order to obtain all-round fire, which requires prior construction or preparation of firing positions for the heavier types.

It is easily seen how its advantages greatly outweigh its disadvantages, because of the preponderating tactical values of the former. An understanding of these things is necessary to a proper appreciation of conditions attaching to its tactical employment. Let us now consider separately, a little more in detail, the three principal rôles of heavy railway artillery.

HARBOR DEFENSE. Railway artillery may be used either to supplement the fixed defenses of a harbor or to provide defense for a harbor where none is installed. This refers to harbors whose occupation would be an enemy objective, or where an enemy fleet might attempt a distant bombardment of port utilities, navy yards, sheltered warships, important centers and terminals, or to run by with a similar end in view. To guard the entrance channels and to compel an enemy fleet to stand beyond range of his objectives, those defenses are becoming established further out with the development of long range armament. Only extremely high-powered large-caliber armament is now being installed in harbor forts, as mobile heavy artillery will be able to fulfill as well or better the functions of existent or pre-existent fixed major calibers, and may be expected in time mostly to replace them.

The utility of railway artillery in this connection is obvious. An extreme example is the Isthmus of Panama, where in a few hours big guns can be shifted from one coast to the other and readily emplaced in previously prepared positions. In New England, with excellent main line facilities almost paralleling the coast, a similar shift from Portsmouth to Boston or Portland, or from Boston to Portsmouth or Newport, can be accomplished.

Thus railway artillery is becoming more and more a factor in harbor defense. That it cannot wholly replace fixed armament is manifest from the fact that it is tied to the mainland, whereas the advancement of positions to overcome the increasing long range of naval weapons requires the use of islands outstanding harbor entrances as positions, and here the fixed cannon will hold its own.

OPPOSAL OF LANDINGS. Assuming that we have lost sea control, an enemy attempting a landing on an extended semi-protected beach, such, for example, as Old Orchard or Ogunquit on the Maine coast, would debark his troops in boats from transports lying out from shore. Those troops would be confronted by infantry, machine gun, and light artillery fire. The boats would therefore be covered by light and medium gun fire from unprotected naval craft or the transports themselves. For neutralization of this, heavy tractor or light railway artillery would be employed from shore. That would necessitate enemy support by second line or even first line warships, and here the heavy railway artillery finds its role.

Organized for concerted resistance, with the coast as a front line and the harbor fortifications for strong points in that line and heavy mobile armament playing a shuttle part in the whole self-contained system, not only would our own fleet (if still in control of the sea) be free for more advanced operations against the main hostile fleet, but it is extremely unlikely that an enemy would hazard the undertaking of landing a force as a secondary objective, even if our fleet was not in being.

OPERATING WITH A FIELD ARMY. The third principal role of heavy railway artillery is as a G. H. Q. reserve of high-powered armament with an army operating in open or stable land warfare. Its mobility brings it from the original domain of its proper corps into the realm of the field forces, with a consequent extension of missions and a greater diversity of objectives. As such, it is employed against targets in zones of the enemy area that are beyond reach of corps artillery, extending from about 10,000 yards from our front lines to the extreme limit of its ranges. We find here certain distinctions as to tactical control, missions, objectives, and fire action from those pertaining to coastal operations, which require consideration.

TACTICAL CONTROL. Organized coast defense by a combined field force calls for a special tactical organization because of the magnitude of the front to be covered by operations and their relatively stabilized character. Even so, there is to be found much analogy to an army front in land warfare. The coast is apportioned into "frontier-commands" (corresponding to an army front, except as to extent) and those are divided into "defense sectors," which each embrace a series of local commands known as "harbor defense commands" or "beach defense commands" according to their character.

Railway artillery allotted to a field army is held as a reserve under control of the army commander, except in special circumstances, as when assigned to a detached corps or even division. In coastal operations, the railway artillery allotted to a frontier command is partly held in reserve under control of the frontier commander, but mostly is assigned by him to sectors and again by the sector commander to local commands—harbor or beach defense, direct control in all cases passing with the assignment.

GROUPMENT. This brings us to the ultimate disposition of units with respect to mission. The basic tactical unit of railway artillery is the battalion. The distribution of battalions is based on the location of objectives, rather than with a view to employing the regiment as a whole. In both field and coastal operations, battalions became widely separated so as generally to render direct control by the regimental commander impracticable. Often battalions from different regiments will be so placed with respect to each other that it is advisable to group them locally under a single commander for coordination.

This provisional organization is easy to visualize for field operations. For coastal operations let us make a type case. Suppose the New England coast is a frontier command, divided into several sectors, and that the 601st Coast Artillery (among others) has been assigned to the sector embracing Portland and Portsmouth harbors and the beaches between. The sector commander assigns the two mortar battalions to the Harbor Defenses of Portland and the gun battalion to the Beach Defenses of Saco Bay. The harbor defense commander assigns one battalion to one fort and the other to another, while the gun battalion would perhaps be in a groupment at Old Orchard Beach with a battalion from some other regiment, under a local commander. At each fort the mortar battalion would be associated with the groups already contained there as a groupment corresponding to that of the gun battalion. In those circumstances the regimental commander and staff become available for assignment to groupment command.

It is not meant that the regiment is never expected to function as such, but to impress that the prime consideration is the tactical situation with the battalion as the basic unit.

MISSIONS AND OBJECTIVES. In coast defense operations, the general missions are to prevent occupation of harbors or raids on coastal cities, to neutralize naval bombardment of port facilities and naval bases, to protect the bases of our own fleet, and to repel a landing in force. The objectives will be naval vessels, against which the tactical employment of railway artillery will conform with that of the fixed defenses. Targets may be moving or stationary. Fire may be direct or indirect. In beach defense the same general principles will govern.

In field army operations the missions will generally be breaking up large troop concentrations and cutting off reinforcements and supplies by damaging, destroying, or isolating the enemy's chief centers of concentration or activity, or neutralizing or silencing distant heavily protected artillery, or assisting in the reduction of a besieged place. The objectives will usually be railway centers, military depots, ammunition dumps, fortified woods or villages, road intersections, tunnels, bridges, etc. These will be stationary targets, and fire will mostly be indirect.

FACTORS IN EMPLOYMENT. In any situation the many special considerations involved in the use of this class of artillery requires the preparation beforehand of plans, carefully conceived. The regulations prescribe that the plans of an army or frontier commander should establish a complete system of alternative firing positions. For coastal operations these may be determined and provision made for their establishment prior to hostilities, because both the line to be occupied is already defined and a pre-war organization exists for its control. For land warfare this, of course, cannot be done until the theater of operations has developed, but, where practicable, it should be before the opening of the operation and, if possible, before the armament arrives in the area. Otherwise the group commander, who is the essential tactical commander, must expect that his recommendations will be required as to the location of firing positions and all other details concerning the tactical employment of his group. Either in coastal or land warfare operations, in some instances a subordinate commander may be confronted by situations not covered by previous plans and will have to work a wholly original problem.

It is to be noted that the primary consideration in the tactical employment of railway artillery, with a view to emplacement for the most effective fire, is the availability and disposition of trackage. In this, the general location of existing railways with respect to the approach of desirable firing positions, the requirements of those lines for other purposes, the possibility of their interruption by enemy fire, the strength and location of bridges and trestles, the width of tunnels, and the availability of sidings for storage tracks are all important integrals of the problem.

Railway trackage in rear of the railheads or behind the combat zone may be operated by the commercial or military service to which they

belong. Trackage in the combat zone in advance of the railheads is under the control of the army or frontier commander and is operated and maintained by the Engineer Corps. In some circumstances available trackage may be placed under the direct control of the superior railway artillery commander, in which case he will organize a system of operation by artillery personnel.

This would probably be accomplished by means of provisional units formed directly from replacement troops, as it would be undesirable to draw on the combat units for this. But whatever might be the general method of operating the railway used, it is important to note that in many emergencies a railway artillery unit may find it necessary to perform for itself duties ordinarily performed by the regular operating forces, including not only traffic work but emergent repairs of breaches in the line, re-inforcement of bridges, and, especially, laying short spurs on its own account or assisting the Engineers in preparing access tracks and firing positions. To this end the regulations require that railway artillery troops "will be organized, equipped, and trained to enable them to perform in emergencies the duties essential to their units that are normally performed by commercial or military railway engine, train, yard, and roundhouse personnel," and provision is made for a certain amount of track-laying equipment and the training of track parties in each firing battery. Every railway artillery officer therefore should have a general practical knowledge of the principal features of railway operation and track construction.

FIRE ACTION. This cursory discussion would be incomplete unless it covered in brief measure the matter of fire action. Whether in coastal or field army operations the classes of fire action employed are essentially the same, whatever the primary mission, the class of fire itself being determined by the type and character of the objective. Their applicability in either role, coastal or field, are readily recognized. They are:

- (1) Harassing fire—to annoy and lower the morale of the enemy by the infliction of damage and casualties;
- (2) Interdiction fire—to prevent enemy movement into or within a given area;
- (3) Neutralization fire—to prohibit the activity of a given enemy element;
- (4) Destruction fire—to effect the material destruction of a given enemy element.

It is not necessary here to go into the detailed principles involved in the employment of these various classes of fire action, but we should note that in field operations their various employment conforms with the principles of fire tactics and methods of fire control used in land artillery warfare, and that in coastal operations they are used in conformance with

the fire tactics and system of fire control pertaining to the fixed armament of equal calibers.

OBSERVATION OF FIRE. On this point I can best quote T. R. 435-25, which states:

The fire efficiency of railway artillery is directly dependent upon the observation of fire. * * * Both in coastal and field operations, observing stations must be provided for the observation of fire, and aerial observation must be employed for firings against targets beyond the limit of visibility of terrestrial stations. Continuous observation of fire is necessary to insure the maximum efficiency in long range firings and every effort must be made to effect the complete organization of the observation service in each railway artillery command. * * * Because of the limitations of visibility imposed upon the terrestrial observation stations by such conditions as lack of suitable height of site, the masking effect of certain terrain features, the concealment afforded the target by defilade and camouflage, and the presence of smoke, fog, or haze, constant recourse must be had to aerial observation in the long range firing cannon common to railway artillery. This condition compels close cooperation between the air forces and the railway artillery in order to provide the coordination necessary for success.

It might be added that this last is specially applicable in coastal warfare, since due to the development of the smoke screen by naval warcraft it is likely the batteries may never see their target at all and have to depend on salvo point or map fire aided from the air. But whatever the expected conditions may be, in all cases provision should be made, where practicable, for both methods as alternatives.

COMMUNICATIONS. In general, there is only to be said here that it is requisite for a railway artillery unit to be self-contained as to its communications service. Unlike units of other arms, it cannot depend upon the Signal Corps for any part of that service. The fire control of its own elements, exchange of word with cooperating aircraft, transmission of messages and orders within the command, and communication with adjacent units and superior headquarters, are all so inter-related that direct control over all elements of its communication system is vital to the effectiveness of the unit in action. Railway artillery units must be prepared to install, operate, and maintain their own system of signal communications. All of the usual agencies are employed, and these must be so organized and coordinated as to insure alternative means for every purpose during combat. This is essential to the efficiency of the unit not only because of the distances involved in the wide distribution of its elements, but because of its great firing range and the distance it must often operate from other units. In the formulation of plans for tactical operation, therefore, the communications service becomes a tactical factor of even greater importance than it is with other troops.

The Military Policy of the United States

By MAJOR H. C. ALLEN
Coast Artillery Corps

DEFINITION.—Before taking up the discussion it might be well to define military policy and consider how the policy for the United States is established or determined.

a. Webster's dictionary defines policy as "a settled or definite course or method adopted and followed by a government, institution, body, or individual." From this the meaning of military policy is evident.

b. Our policy is based on and determined by the laws enacted by Congress and by the regulations issued in accordance therewith. Whether our policy is sound and effective or weak and ineffective depends to a large extent on the character of this legislation.

FROM THE REVOLUTION TO THE WORLD WAR.—*a.* Throughout this period the country ignored most of the lessons from each war and persisted in maintaining a small, inadequate, non-expansive standing army, and meeting every national emergency by the use of large numbers of raw troops. Each war demonstrated the folly of this policy, but the lesson was not heeded.

b. Some of the reasons for and the defects of our policy can be summarized as follows:

- (1) At first a weak Central Government.
- (2) Makeshift legislation or resolutions by law-makers ignorant or not considerate of fundamental military requirements.
- (3) Unwarranted fear of a standing army and unwarranted belief that unorganized military resources constituted immediate military strength.
- (4) Surrendering to the individual states the duties and responsibilities for National Defense that were properly Federal functions.
- (5) Reliance on raw troops, voluntary service, short term enlistments, and geographical isolation.
- (6) Failure to make sane provisions for replacement or to use available trained personnel to advantage, and failure to appoint a supreme commander.
- (7) Failure to provide an adequate standing army organized for rapid expansion in time of war, and failure to provide plans for higher organization and training for commanders of higher units.

- (8) Political interference, political appointments, and complete failure to prepare for a probable war even when imminent.

c. As a result of this defective policy, luck played an important part in winning two wars—all were unnecessarily prolonged and their costs were excessive in both lives and money. The fact that in the Revolution and again in the War of 1812, the country employed a total of nearly a half million men to oppose a British force that never exceeded 42,000 is strong indication of a poor military policy or possible evidence of none.

d. In considering this period of a hundred and thirty-five years in our military history, during which our military policy was generally poor or non-existent, it is at least encouraging to note that there were a few military laws of a constructive nature. These may be briefly summarized as follows:

- (1) West Point was organized in 1802 and later increased. The West Point training did much to make the Mexican War a bright spot in our military history.
- (2) The Infantry and Cavalry Schools were established at Leavenworth in 1881.
- (3) A General Staff and the War College were provided in 1903.
- (4) The militia, now known as the National Guard, was reorganized and placed under partial Federal control by the Bill of 1903 and 1908. This bill had many defects but was a step in the right direction.
- (5) The general educational system in the Army was improved by better service schools, and provision was made for limited military training in some colleges and universities.
- (6) The Regular Army was increased after the Spanish War to 100,000. This was contrary to all precedent. Contrast this with the Act of 1795 after the Revolution authorizing the President to disband the Regular Army.
- (7) Considerable improvement was made in organization, training, and equipment, and marked improvement was made in our coast defenses.

e. In spite of improvement it must be admitted that our military policy of 1914 was not such as to provide reasonable defensive measures against a first-class power. The country, as a whole, still felt that America was invincible, and that our patriotism, unorganized man-power, and natural resources constituted real and immediate military strength. The citizens trusted the defense of the country to the Lawmakers, and they often trusted it to our National motto and Luck.

The World War Period.—During the period of the World War we find a marked improvement in our military policy—observation of the

World War led to the passage of the National Defense Act of 1916. This was a wonderful step forward—the law included many excellent provisions for the Regular Army, the National Guard, general and industrial mobilization.

As to our military policy during this period, there is little to condemn and much to praise; considering our unpreparedness it must be admitted that the war was effectively and efficiently conducted. Most of the blunders of past wars were avoided. Legislation was prompt and effective. The President was given almost unlimited power and funds. The short term enlistment was totally avoided by the draft. A supreme commander was promptly appointed. There was only limited political interference, and prompt and comprehensive steps were taken to provide munitions and supplies. It is true that the country had to depend on our Allies to hold the enemy at bay while we mobilized and trained, and had to depend on them to a great extent for our arms and ammunition. However, the essentials to turn the tide were money, trained man-power, and morale. These the country supplied.

The only essential defect of the policy at this time was the failure to draft the man-power needed to operate the war time industries. Considering our unpreparedness, this was probably impracticable.

Today.—Our present policy is based on the National Defense Act of 1920 and the regulations issued to provide for the features which were usually left to the discretion of the President. A brief and clear summary of the intent of the law providing for this new policy is contained in the Presidential statement of June 13, 1921, which reads as follows:

Our present National Defense Law establishes an economical and democratic military policy thoroughly consistent with our National traditions. It provides for a small Regular Army to be augmented by great citizen forces in the event of national emergency. This is our traditional military policy. But where, as in the past, these larger war forces have been extemporized after the occurrence of an emergency, the new law wisely provides that the framework of this organization shall be established and developed in time of peace, in so far as this is practicable through the voluntary service of our patriotic young men. The Army of the United States, as defined in the new law, comprises the Regular Army, the National Guard, and the Organized Reserves. Every patriotic citizen should encourage the development of these forces, each within its proper sphere.

The Act and related regulations are somewhat complicated, as they include the many details necessary to weld our former military institutions into the permanent structure of the new Army of the United States. With most of this detail we are fortunately not concerned and will therefore consider only those provisions that permit the new policy to be free from the serious defects of the past.

The law provides—

- a. For a small but readily expansive Regular Army.
- b. For an expansive, well-trained National Guard of about 400,000.
- c. For a framework of usual dimensions, and special units about which the great citizen forces can be locally mobilized and trained.
- d. For an officers' and enlisted reserve corps to provide a reserve of officers and the trained personnel for the framework of skeletonized reserve units.
- e. For the R. O. T. C. and the C. M. T. C. as a training school to provide a uniform flow of new officers and key enlisted men to the reserve corps. This feature is of special importance as the existence of the reserve corps depends to a great extent on the success of the R. O. T. C. and C. M. T. C.
- f. For a General Staff Corps which includes the War Department General Staff and the General Staff with troops. The former includes the War Plans Division, charged with the duty of preparing plans for national defense and plans for mobilization of the country's man-power and natural resources.
- g. For training for all components. This includes an excellent system of service schools, annual training periods, and active duty for a limited number of reserve and national guard officers with the War Department and at the Service Schools. Having National Guard and Reserve Officers on duty with the Militia Bureau and W. D. General Staff should help materially in producing results and furthering the one Army idea and spirit.
- h. For territorial organizations to permit decentralized control for purposes of administration, training, and mobilization. Nine Corps Areas are organized, and, in time of peace, each should contain one Regular Army Division, two National Guard Divisions, three skeletonized reserve divisions, and certain corps and army troops. In case of war, each unit would be mobilized, equipped, and trained by the Corps Area in which its framework was located.

There are many other provisions, of which two are of particular interest—one eliminates short-term enlistments by providing for service during the emergency; the other eliminates the confusion and delay in obtaining supplies and munitions by providing industrial mobilization. Much has already been accomplished and even today telegrams from the Supply Branches would immediately start quantity production of many of the essential items.

Another provision essential to our policy is a Selective Draft Law. Although this is not provided by any existing law it is provided for by precedent and will, without doubt, become a law in the case of a major emergency.

Although our present policy may not be perfect, it is infinitely better than that of the past and should, with necessary and reasonable appropriations, provide for the national defense.

The question of the necessity for a sound Military Policy needs little discussion since it is not believed a single reason can be advanced for continuing our past policies, whereas there are an infinite number of reasons to indicate the need of a sound one.

Reverting to our definitions, a sound policy, a sound plan, adopted and followed, is evidently essential to the conduct of any enterprise, much more so to the serious business of defending the very existence of a nation.

Even a casual study of our military history will show that the past policy has cost excessively in money, time and lives, and that in every case the failure to adopt and follow a sound policy was false economy. One may ignore these facts but they can not be disproved.

If you will read past history, you will find that wars make armies and navies. Armies and navies do not make wars. In this country, which is a non-military country, our statesmen are in complete control. When these statesmen decide on war, they call upon the Army and Navy to bring about peace again. When in 1898 our statesmen decided to interfere in the administration of Cuba by a foreign country, our statesmen decided on war. They called in the Army and the Navy to prosecute this war and to restore peace. In the recent great war, we did not go to war until our statesmen decided to go in and our Congress had approved.—*Captain Overstreet.*

Duties of the Citizen Under Our Military Policy

By MAJOR K. T. BLOOD
Coast Artillery Corps

ACCORDING to the Fourteenth Amendment to the Constitution, "All persons born or naturalized in the United States and subject to the jurisdiction thereof are citizens of the United States and of the state wherein they reside." The legal status of a citizen is thus defined; but what constitutes citizenship? It is the sum total of the rights and duties that come to us from our membership in the nation.

A general discussion of the rights and duties of the citizen would be inappropriate, and it is sufficient for me to state that for every right there is a corresponding obligation and that one of the most important of these obligations is service in National Defense. Each citizen should be potentially a soldier ready to take his place in the ranks in time of peril, either in the field or in necessary productive activity, for adequate national defense depends upon the nation in its entirety.

In applying the principles of American citizenship no distinction is drawn between the citizen in uniform and the civilian. However, I will confine my discussion to the duties of the citizen who, in every day life, is a civilian.

Having determined to do his share as a citizen, how can he fit into the general scheme of national defense?

In time of war every civilian will be given an opportunity to present himself for military service. Failing in this he will undoubtedly be drafted. In either case he will function as any other army man, and I believe no discussion is necessary.

In time of peace various fields are open for endeavor, some requiring qualifications, others open for all. As we know, the more important of these fields are the National Guard, the Organized Reserve, the Reserve Officers' Training Corps, and the Citizens' Military Training Camps.

The National Guard represents a great decentralized army, which in time of peace is under the direction of the States for maintenance of law and order and, in an emergency, is ready, with the Regular Army, for immediate field service. The National Guard organization accordingly constitutes a very important component of the army and should not be allowed to fall below strength.

No one can question the usefulness of the Reserve Corps under our present plan for national defense. As a connecting link between the per-

manent establishment and the people themselves, it is of tremendous value. The reserve personnel are our main dependence for building the army required for a major effort. The Organized Reserve consists of the Officers' Reserve Corps and the Enlisted Reserve Corps of key men. There are approximately 160,000 Reserve officers required, of which about 90,000 are now enrolled. The enlisted reservists number but a few thousand. Of course many times this number are required.

As part of the national defense project there is injected a method of replacing those officers who leave the Reserve Corps for one cause or another. The plan is to train young men for these positions in the various schools of the country by imparting military instruction at the same time that they are acquiring their academic education. These bodies in the various schools constitute the Reserve Officers' Training Corps. A graduate receives a Reserve Commission and is normally assigned to a Reserve Unit in his own locality, thus becoming a part of the Army of the United States. The present annual output of the Reserve Officers' Training Corps is nearly 5000 officers. Twelve thousand is a conservative estimate of the yearly requirement.

For the solution of the problem of providing for officer and enlisted expansion, the National Defense Act has provided, and the Government has instituted, the system of Citizens' Military Training Camps. At these camps, military instruction is imparted to the young men of the country who are not so fortunate as to receive this instruction while attending school or college. They furnish a means of voluntary military training in lieu of a system of universal military training. In the event of actual occurrence of the decentralized mobilization which our plans contemplate, the local commander will have a valuable start if the neighborhood organization has a reasonable group of summer camp graduates. Therein lies the value of the Citizens' Military Training Camps. They teach good citizenship and military fundamentals to the potential war-time recruits. The Citizens' Military Training Camp system should therefore spread more evenly over the country so that each community will secure its representation in the defense system.

It is evident that each one of the components enumerated requires the whole-hearted support of the citizen. Not only should he become a member of the organization but he should exert his influence to bring in others. Suppose the citizen does bind himself in time of peace to serve the nation in war—is that sufficient? No! He should become an *active* member, and by taking advantage of the opportunity for military instruction, insure the present and future efficiency of the defense organization.

There are many thousands of officers and men with war experience enrolled among the members of the National Guard and the Organized Reserve, but it is safe to say that comparatively few came out of the World

War with a clearly defined conception of the doctrine governing their respective branches and of the responsibilities devolving upon the personnel thereof. Many were quickly prepared for their service in 1917 and 1918 and had no opportunity to test out in practice the theory with which they were necessarily crammed.

In view of this fact the reliance of many ex-service men on their war experience is plainly ill advised. Furthermore, it is now seven years since the armistice of 1918, and military science, like any other science, is subject to change. Clearly, then, the citizen should not count on his prior military education but should keep abreast of the progress in military science by taking the periodic instruction afforded by encampments and by correspondence and service school courses.

The Reserve and National Guard officers should cooperate. The Reserve officer often can direct desirable recruits to the National Guard; and the National Guard can afford the Reserve officer opportunities for meeting and for training. As civilians they should assist the Regular officers in establishing friendly relations with Chambers of Commerce, Rotary Clubs, and fraternal organizations, where a great deal of good can be done in educating the public to the military needs of the country. The Reserve officer should attend his unit gatherings and the meetings of the Reserve Associations. He should popularize his organization in the community by participating in patriotic demonstrations.

The Enlisted Reservist is more limited in his opportunities but, briefly, he should emulate the officer in taking military instruction and in making himself known and felt in the community.

There remains for consideration the citizen who, for good reason, is ineligible for strictly military service. There is much important work for him to do. He can find a place in the scheme for the organization of commercial resources provided by the Act and can assist in the cooperation of business concerns to that end. He can and should exert legitimate influence for favorable legislation and he can be of the greatest assistance in the spreading of patriotic teaching.

Thus it is seen that our present military policy is thorough and far-reaching, providing room for each and every citizen to put his shoulder to the wheel.

As Governor Baker of Missouri has so well stated, "If the present scheme of national defense is properly carried out by the citizens, the errors of the past will be avoided. It is the duty of every citizen to prepare himself to function intelligently in the defense system of his country."

Duties of the Regular Officer Under Our Military Policy

By MAJOR H. A. BAGG
Coast Artillery Corps

DURING the various changes in our Military Policy the Regular Officer, other than those on duty in the War Department, had little or no responsibility regarding it, except to improve himself in his chosen profession—that of being a soldier. This condition continued until 1920 when, under the revision of the National Defense Act, the War Department evolved a policy under which the Regular officer had certain duties and responsibilities, though neither were clearly defined.

Under the present policy it would seem that the Regular officers fall in two distinct classes, with duties and responsibilities widely different.

First—Those officers on duty with the Regular Army.

Second—Those officers on duty with the civilian components.

The officer in the first class is in the same status that we all were prior to 1920—that of following his profession in a dignified way—improving himself whenever possible. His responsibilities lie wholly within one sphere—that of being sure that when the time comes he, as an individual, will not be found wanting, and that the confidence and trust put in him has not been misplaced.

The officers in the second class are faced with an entirely different problem; they are as a rule away, scattered throughout the United States, and are in daily contact with the civilian population. By civilian population I do not mean the men comprising the various components of the Army of the United States, but the civilian in no way connected with the military.

Their responsibilities and duties fall under two general headings; first, they represent their Government and the Army in the locality where they are stationed. Their chief responsibility in this respect is to see that their conduct is such that they do not bring discredit upon the service. The public at large is prone to judge the entire Army by the impressions received from the representatives they meet in their own section. They should therefore be more careful of their actions and speech than otherwise.

Secondly, they are, in addition to their other duties, responsible to their Government that they accept every opportunity to further the mili-

tary policy in their locality; to enlighten, and, if one might be permitted to use the term, instruct the civilian population in the true meaning of the military policy of the United States.

Under this last heading comes a subject which can not be passed over without a word of caution, for under it has arisen most of our troubles during the last few years.

There are many officers who are obsessed with the idea that they must "*sell the Army*" as any one might sell a piece of goods, real estate, or security, and by so doing believe they are furthering the military policy of the United States.

There are others who, realizing that they have been given certain duties and responsibilities relative to the policy, but having nothing tangible with which to work, proceed to sow the seed of military policy and National Defense as they see it as individuals. These men are known to be army officers, and if the policies outlined by them do not meet the approval of the average civilian, he immediately takes the attitude that these officers are after the control of the Government by large increases in the military establishment, and has visions of a military form of Government being started, and that the Army officers scattered throughout the United States are to be the military governors, mayors, etc.

There is another angle to this, and that is that unless these officers are given a basis on which to work, there will be as many military policies as there are officers on these various details.

There is no doubt in the minds of any one who has given the subject careful thought, that the regular officer has certain duties and responsibilities relative to the military policy of the United States, but to him does not belong the duty of formulating such a policy, nor should he be out trying to sell the Army, for by doing so he is lowering his profession.

He should understand that the military policy is formulated and regulated by the civilian population of the United States, through their representatives in Congress in conference with officers on duty with the War Department.

He should understand that his sole duty relative to the same is carrying out that policy.

He should understand that his responsibilities are to give the civilian population as much information regarding it as possible by accepting every opportunity to give talks on the military policy before clubs, organizations, etc., and if such opportunity is not afforded to do as much as possible to obtain such.

He should be sure that his audience understand that they, not the Army, formulate this policy and that the Army's mission is the carrying out of their will.

He should take pains to explain the workings of the policy and the benefits the civilian population derives from it, the protection it affords them and their children.

One of the strongest talking points, and one, by the way which will win over some of the more stubborn men, is to liken it to insurance. Most of these men carry life and fire insurance, but they do not desire death nor a fire just because they are insured. They have simply provided for an emergency in case trouble overtakes them. The same is true of our military policy. Just because we have a policy we do not desire a war nor to become aggressive, but, as in insurance, it is a means providing for an emergency in case of trouble.

He should remember that many civilians are not familiar with our military policy—they are busy earning their livings in other fields; therefore it is the duty of any Regular officer to take the time, trouble, and pains to explain in detail what it is.

He should not assume that the person to whom he is talking is familiar with it, for nine out of ten are not. Many who are opposed, or at least give an impression of being opposed to it, are doing so through ignorance of what it is all about, or because they have been given gross misinformation regarding it.

You may smile and think that intelligent people would know and would not believe weird tales they hear, but such is not the case. Only two years ago I had a lady (and a well-educated one) tell me that her son wanted to go to a C. M. T. Camp, but that she was opposed to it for she had been told that the officers in charge did everything known to instill a desire to kill into the minds of the boys; that they killed animals and smeared the bayonets with fresh blood; and did other horrible things. After talking with her, she became convinced that such was not the case and finally allowed her son to go. She later found that she had been given gross misinformation, and the next year she told me that the previous camp had done her son so much good that she was very happy when he wished to return the next summer.

To summarize in a few words. The duty of the Regular officer is not to sell the Army as though it were a piece of cheap merchandise, needing much advertising to put it over, but instead to place before the civilian in a dignified way what our military policy is, and be able to explain its workings; constantly reminding him that he—through his representatives in Congress—formulates the military policy, and that the Army is merely the agency which carries out that policy once it has been formulated by the citizens of the United States.

Our Military Policy

By MAJOR L. B. MACRUDER
Coast Artillery Corps

THE course of a nation in seeking Security, which follows from a sound military policy, has been likened to the experiences of Christian in the early English Epic, *The Pilgrim's Progress*. The analogy is so apt that I ask you to bear with me while I quote the passage in which Christian is proceeding down the road which leads to Salvation—in our case, Security, and encounters wayfarers—in our case, our fellow citizens.

I saw there in my Dream that Christian went on thus even until he came at a bottom where he saw, a little out of the way, three men fast asleep with Fetters upon their heels. The name of the one was Simple, another, Sloth, and the third, Presumption. Christian then seeing them lie in this case, went to them, if peradventure he might wake them, and cried, "You are like them that sleep on the top of a mast, for the dead sea is under you, a gulf that hath no bottom. Awake, therefore, and come away; be willing also, and I will help you off with your Irons." He also told them, "If he that goeth about like a roaring lion comes by, you will certainly become a prey to his teeth."

With that they lookt upon him, and began to reply in this sort: Simple said, "I see no danger"; Sloth said, "Yet a little more sleep," and Presumption said, "Every Vat must stand upon his own bottom," and so they laid down to sleep again, and Christian went on his way.

We all know the modern counterparts of Simple, Sloth, and Presumption, working through ignorance or intention to interfere with and even defeat the possibility of the present Military Policy of the United States becoming a success. They may be divided for consideration into those who oppose National Defense on *principle*, those who desire to *divert* the money that it costs into other channels, and those who are only *indifferent*.

Those who oppose it on *principle* see in it two dangers. It gives us, they believe, the strength to pick a quarrel with foreign countries, and gives rise to competitive armaments. It engenders, they think, a hard, illiberal mind in world and domestic politics, and destroys democratic society; in other words, it tends to Prussianize the body politic. Behind all this is the Pacifists' ever-present, foolish fear of military force as an instrument of government. There are others in this group, who oppose a proper Military Policy because it is essentially conservative. It will be used at home and abroad, they think, to maintain that which is rather than that which ought to be. It makes progress difficult. The Pacifist is prob-

ably the chief contributor to this group. He is dangerous in peace and harmless in war, though a nuisance and consumer of substance, without being a fighting man. They persuade themselves that the use of force is the essence of evil and illiberalism. They believe that instruments of force, if present, will lead to their use. In this fear of force, the modern liberal, the Pacifist, is illogical. For force, though repressive, has no real effect in the end on liberal principles. It only nourishes them. If liberalism means anything, it affords an opportunity to men to live their lives under conditions permitting the maximum of free expression. If force is necessary to create or to maintain that order of things against its enemies then force obviously must be used. On this principle of the use of Force, allied with liberalism, revolutionary America was created. And only on this principle can the America of today be maintained and survive. The Pacifist would destroy the bulwark of liberalism by which he is defended. He would break down his own strength in order to be more truly liberal. Liberalism that looks beyond its immediate impulses cannot deny that Force in the form of a sound military policy, founded on the participation of every citizen, is its necessary and logical concomitant. It is as rational for it to urge the abolition of insurance and fire and police protection as to deny to the State its right to prepare for self-defense.

Those of the second group, and they are the most dangerous, are opposed to a proper National Defense in policy, but not in principle. It is a group that is selfish; that desires the money that National Defense costs for other purposes. It includes a diverse membership, from the alien plotting in behalf of a foreign power, like the Communist, to the trade-unionist attacking the National Guard. It includes earnest men who fear that our preparations for defense will be used in a manner dangerous to American principles, and also traitors to this country in spirit and in deed. Members of this group are only open to conviction by the special pleading that overcomes their personal opposition to adequate defense. They, like the small politician with the tariff, have made National Defense a local issue.

Defense as a general principle need not be urged upon them. They probably, unless paid aliens or traitorously inclined, are in favor of it; their narrow objections only need be met.

The last group, and they are in the majority, hinder a proper Military Policy by a bland indifference to the entire subject. They are the mob, who, when war comes, disgrace America with their ferocity and intolerance. In peace, they give no help to defensive measures, not because they oppose but because they do not care and do not know. In War, they are unreliable, a source of danger and a drag upon the smooth functioning of the war machine. This class is a field for endeavor and should yield

to educational effort. So much for the modern prototype of Simple, Sloth, and Presumption.

We all know what our present Military Policy is and our responsibilities in the premises. We have, in China, an example of what the lack of a proper Military Policy has brought upon a vast and populous country. It remains for us to examine our adopted policy to determine if it is in keeping with our National ideals, doctrines, aspirations, and political interests; if it is adequate and suited to our needs; if it is based on sound assumptions; and what faults, if any, are inherent in it. To be brief, we can answer in the main, that it is satisfactory, except as will hereafter be pointed out.

Having reached the conclusion that the policy is fundamentally sound, let us now examine the progress that has been made under the National Defense Act to determine if what has been done is sufficient and if the policy as now exists will meet the strain of a major emergency. For if our present policy is unsound and unworkable we are living in a Fool's Paradise.

To put the National Defense Act into effect, the War Department decided to accomplish it by successive stages, which were:

- a. Formulation of a basic plan of procedure.
- b. Allocation of units.
- c. Organization of units.
- d. Project for annual training.
- e. Preparation for mobilization.

Step one, formulation of basic plan, has been completed. We all know of the subdivision of the country into Army and Corps Areas, each with its proportionate allotment of troops of the Regular Army, National Guard, and Organized Reserve to organize, train, and maintain.

Step two, allocation of units, has been completed, and the experiences, traditions, and *esprit de corps* of the units of the World War wisely have been preserved in the present organizations of the Army of the United States.

Step three, organization of units, is well under way. Many units of the Organized Reserve have practically their full strength of Reserve officers, and the National Guard is being maintained up to the full strength allowed by the appropriations made by Congress. The loss of veteran Reserve officers is being, in part, replaced by the graduates of the R. O. T. C. and from the C. M. T. C. Here is a grave element of weakness, in that the joint output from those two sources is not yet sufficient to replace the yearly casualties amongst the Reserve officers, much less to build up the Reserve Officers' Corps to its proper strength. Their contribution to the National Guard is practically nil.

Step four, training, is in course of solution. It is sadly hampered by the lack of sufficient instructor personnel, officer and enlisted, proper materiel, and insufficient appropriations. This lack of training and of trained leaders is a source of real danger, for, unless remedied, we will experience again the unnecessary and appalling losses that we suffered in the World War. The possibilities of such losses occurring have been increased by the necessary change in policy (due to the small size of the Regular Army) in designating the National Guard as first-line troops. It is, therefore, mandatory that they be thoroughly trained and properly officered, that they may be really fit and ready to do their whole duty at the opening of hostilities. We must also bear in mind that we have never yet waged war single-handed against a first-class power prepared for war, and that we took over a year, after war had been declared, to train and prepare to take our part in the World War, while the French, British, Russians, and Belgians, not to overlook the Italians and Japanese, held our enemy at bay. It is not reasonable to suppose that this opportunity for preparation will be afforded us by our next foe. Nor do we wish the humiliating experience repeated of having our President forced to decide that it is inexpedient for us to go to war due to lack of readiness to wage war, as was done by Mr. Roosevelt in 1905, when he declined to go to the assistance of Korea, when seized by Japan, although we were bound to protect her by a solemn treaty entered into by our respective countries and our aid had been sought.

In step five, mobilization, commendable progress has been made. War Department, Corps Area, and Unit Mobilization plans have been worked out and are being revised and improved. Two defense tests have been held, with more or less satisfactory results. Plans for industrial mobilization, to eliminate waste, destruction, and useless effort and to insure proper coordination, have been completed or are in process of completion. They give promise of real efficiency and the saving of time and treasure. These have progressed so far as to show that the procurement of personnel will be far in advance of the ability of American Industry, capable and extensive as it is, to equip and supply the troops. This inability to obtain supplies and equipment will therefore delay mobilization and our ability to defend ourselves. It must be remedied by the building up of war reserves of supplies, equipment, and ammunition.

In conclusion, it can truthfully be said that, for the first time in our history, we have a sound military policy, although at best it is a compromise between the correct solution of universal service and the too expensive system of a large professional army. It also can honestly be stated that real progress has been made in putting it into effect. We have at last heeded the admonition of Washington, "In time of Peace, prepare for War." Those plans do not, of themselves, provide for national security,

any more than the plans of an architect build a house. However, in the National Defense Act, we have a pattern or mould, with trained puddlers provided, into which will be poured, under competent direction, the manpower of the Nation. This plan, if followed by our people and loyally supported by them with service and by the Congress with adequate appropriations, will provide a reasonable guarantee for our national security. Let us of the Regular Army do our part in making known in a proper way the present wise military policy of the United States and take as a guide the words of General Pershing: "The development and training of the National Guard and the Organized Reserves is the first and most important mission of the Regular Army."

There is in America no military caste thinking of war and regarding war as its natural occupation. The officers of the Army and the Navy keep themselves apart from politics. They are professional in spirit, highly trained, proud of their training, many of them men of great ability and technical competence, respected and trusted by the nation. They do not desire war, nor long, as the soldiers and sailors did in Prussia and Austria * * * for opportunities of displaying their capacity in action. America is the only great country in which the fighting services are exempt from all that is expressed in the single word "militarist."—*Lord Bryce.*

EDITORIALS

C. M. T. C. Students

THESE youths of today are the men of tomorrow—the lawyers, the merchants, the officials, and the politicians. Are they going to be healthy, active citizens, imbued with a love and understanding of American ideals—with regard for law and order, which is a prime requisite in nature? It is our belief that they are.

The young man who goes through a course in the C. M. T. C. is not only having a good time, but he is getting instruction in the best way—by doing. He is obeying orders so that some day he may give orders; he is learning that the United States of America was founded by men who believed in law, and that without law no man nor his possessions are safe; he is learning that the city can teach the county and the county the city; he is learning that the white collar can meet the flannel shirt and the cowhide boot the patent leather, and all are kin.

These camps are made up of a cross-section of America's youth, one of the most democratic institutions under the flag. Social understanding and democratic feeling are developed. We hope that young men who can go, will go, and that each year an increasing number of young men may take advantage of the opportunity which is afforded them.

Insure While Young

Because insurance will cost less.—The younger you are when you insure, the lower will be your rate. A man who insures at forty pays nearly twice as much each year for the same form of policy as one who starts at twenty. The rate at which you insure is the rate you will continue to pay.

Because you are insurable now.—Life insurance cannot be bought, as other commodities are, by any man who has the money to pay for it. The applicant must be in good health. You may become uninsurable any day; and even although you yourself may continue in good health, some of your family may die of a disease which will affect your family record and render you uninsurable in any company.

Because you will need insurance.—Even if you are not married now, you probably will be. Then you will commend yourself for your pru-

dence in having insured when the rate was low, and you will be glad that your policy is already well on the way to maturity.

Because insurance will help you save.—There is no better way to acquire the habit of saving than by taking a life insurance policy. The necessity of making deposits regularly has enabled many a man to save who would not otherwise have done so.

Because it will make you independent.—You do not wish to become, like so many old men, dependent upon relatives and friends when your working days are over. Now is the time to begin preparing for comfort and independence in your old age. Your insurance policy will be your best friend then, for it will be convertible into cash or into a monthly income at just the time you need it most.

Because it creates an immediate estate.—At age twenty-one the annual deposit necessary to create an estate of \$5,000 is only about \$92. In no other way can you create an immediate estate of this size for so small an outlay of money.

Because it is a conservative investment.—The money you invest in a life insurance policy is safe. It is not subject to the hazards which attend many other business ventures. Whatever happens to your other property, you can be sure of your insurance.

Because business men believe in it.—Ask the man in whose business judgment you have the greatest confidence what he thinks of life insurance. His advice to you will be: "Insure while you are young. You will thereby acquire the habit of thrift, provide for your family and your own old age, and at the same time strengthen your business credit."

Keep Defense Insurance

If the United States must economize in the matter of maintaining defense agencies, the National Security League urges that "we do not let our insurance lapse."

The thought is particularly timely because the hour is one when the people and their national administration are particularly concerned with matters of retrenchment and reduced taxation—both admirable policies, but not the only policies with which a nation must be concerned.

"Reports of the Army," says the League, "of which Maj. Gen. R. L. Bullard is president, 'show that it is badly cared for, that morale is low and that sufficient funds are not forthcoming. * * * Our Secretary of War has to demote 4000 men to save money and ask for \$100,000,000 to put the quarters of men and officers into livable condition."

"Repeated reductions in the Army and Navy are being followed by vigorous efforts by pacifist groups to wipe out military training in schools and colleges."

It was perhaps inevitable that the postbellum period should witness a reaction adverse to the Army and Navy, but sufficient time has elapsed for America to recover from that emotion and to study this matter of national defense again in the light of common sense and American historic experience.

It is bitterly true we were forced into the last war unprepared, except as preparation was made by devoted officers of the Regular Army and of the National Guard, who were opposed and handicapped in every way possible by the same elements that now are campaigning against Army and Navy appropriations. We paid a high price for our unpreparedness then. There is reason for fear that we shall pay as high or even a higher price for unreadiness whenever Congress again is forced to recognize the existence of a state of war.

The very least we can do, as a thinking, reasoning nation, is to follow the sound advice the League tenders and absolutely refuse to permit our defense insurance, represented by an efficient Navy and an adequate Army, to lapse.—*Seattle Times*.

The "Costs of War"

Pacifists classify our war debts and our big national bill for rehabilitation and relief of ex-soldiers, as well as our current expenditures for the maintenance of our Army and Navy as "costs of war." In a sense that is true, but a very considerable portion of the bill is due to the unpreparedness of the United States for war during a period when "the world was aflame" and a national policy less pacifistic would have prevented much of this war cost through reasonable preparedness. As it was we had to provide war materials, ships and men at wasteful speed, affording wholesale opportunity for extravagance. Those who are preaching national unpreparedness now may be building up future "war costs" for it is true of every nation that however peaceful it may be, it may have war forced upon it.—*Kansas City Kansan*.

Shocking Condition of Government Military Buildings

According to the testimony of Army witnesses before the House Appropriations Committee, about \$10,000,000 is needed now to keep Uncle Sam's forts, army posts and other army property in a state of self-support, or able to stand alone. It is a matter beyond dispute that many of the forts, arsenals, roads, houses and hospitals belonging to the Army are in shocking condition. If neglected much longer, it will cost twice as much to repair them; and many will have to be abandoned altogether. Questions of economy are complicated by questions of national policy, and Congress has not yet made up its mind as to which road it will take.—*Washington Post*.

Boys, Guns, Sentimentality

The *Gazette* printed a story yesterday that brought a declaration of war from the editorial department. We call it a story; it was an editorial disguised as a human interest yarn. It began "every boy in the country should read this," and related the tale of a youngster who shot his mother, in play, of course, with a gun that "he didn't know was loaded." The story ends with the pathetic picture of the father, sitting "silent and tense" in the hospital waiting room—"he had not been able to say 'no' to the demand of a 13-year old son for a gun."

No guns for modern boys; they implant the desire to kill. No tin soldiers; they breed militarism. No rough and tumble contact; that makes for ruffianism. Give 'em dolls and teach 'em to knit. Bah!

The country owes its existence to the long-barrel rifle in the hands of hardy and courageous pioneers. Perhaps there are no more frontiers to press outward, and the old muzzle loader has given way to the pump gun, but the firearm holds its place. The father made no mistake in giving his son a rifle; his error was in not instructing the lad in its use. We are going in a lot for sentimentality. Everywhere we bump into "don'ts." We need a few "do's." Character and self-reliance are not bred by prohibition. Taking tin soldiers away from a red-blooded boy won't lessen the chances of war but it might, along with other like directions, make him a sissy. Denying him the proper use of firearms was the trouble in the case in point. If boys are to be boys they can't be brought up as girls, and if they are it is a sorry prospect for the future of the nation.—*Colorado Springs Gazette*.

The nation that cannot resist aggression is constantly exposed to it. Its foreign policy is of necessity weak, and its negotiations are conducted with disadvantage because it is not in condition to enforce the terms dictated by its sense of right and justice.—*Grover Cleveland, Message to Congress.* *

PROFESSIONAL NOTES

Non-Detonating Motor Fuels

By LIEUT. COL. JAMES PRENTICE

Coast Artillery Corps

No longer need the refiner market his cracked gasoline under the guise of straight run gasoline. For carefully checked road performances made in various cities with various gasolines are daily proving the superior anti-knock properties of cracked gasoline.

This cracked gasoline, because it knocks less and pulls more, is a premium quality gasoline and is worthy of a premium price over straight run.

The above is an extract from a typical advertisement in a trade paper of high standing. It is but one of many that are now being used to educate the public in the use of what were once outlaw motor fuels. The day of non-detonating gasoline has arrived. Following its universal or regional distribution we may expect to see companion advertisements by the automobile and gas-engine manufacturers calling attention to the increased efficiency of their products due to the use of higher pressures.

The economy of petroleum products is a vital matter, so vital that the President has appointed a commission to see what can be done to conserve our petroleum supply and guarantee suitable war reserves. How can we conserve petroleum when the greatest user—the automobile—is increasing in numbers? There are over 20,000,000 automobiles in the United States; we are manufacturing about 4,000,000 a year and exporting about 500,000 a year in our export trade.

The automobile industry asks for knockless gas so that it can raise the pressure in the engines. The Petroleum industry replies that they have knockless gasses but that the oil industry and the automobile industry have not acquainted the public with the fact.

It is an established fact that if we can double the initial compression of a gas engine we will quadruple the power. At present the average gasoline engine has a compression ratio of about one to four. That is to say that the volume of the mixture as the spark ignites it is about one-fourth its volume under normal air pressure. If we can double our compression we will need only about one-fourth as much gasoline as we now use to propel the existing stock of automobiles. This is an item of economy that is worthy of consideration.

The unfortunate part of it is that when we raise the pressure while using straight run gasoline, the standard grade now insisted on by the public, there sets up in the engine a detonating effect which soon overheats the engine, scores the cylinders, and injures the bearings. This is called knock. It is a peculiar ringing sound accompanied by pounding noises that resemble blows by hammers inside a metallic vessel. This knock is what keeps our engines larger than they should be and so inefficient that it is doubtful that more than one-twentieth of the thermal power of the fuel is used—only five per cent.

Straight run gasoline is obtained by distilling at about 400°F. those petroleum that contain certain volatile fractions. All of the oil fields do not produce petroleum that will distill straight run gasoline. Only about one-third of our crude is fit to make straight run gas from.

In 1910 the writer while at the then newly-reorganized Coast Artillery School, was, with the other members of his class, apprised of the fact that there was no danger of a gasoline shortage and that it would be perfectly safe for the Coast Artillery to go ahead and buy some 24-KW Direct-connected GE sets to generate the electric current that would be needed to maneuver the guns and illuminate the emplacements and magazines. The bearer of these tidings was an employee of the General Electric Company who was in charge of certain engine-designing activities that they were sponsoring to increase the demand for small direct-connected motor-generator sets. He said that synthetic gasoline could be made and was being made and that it would eventually be available at reasonable cost. But he failed to give any inkling as to the ingredients or the methods and principles involved.

Shortly after this there appeared on the market some sickly yellow gasolines which, when burned in gas engines, emitted frightful odors. These came in for the ridicule and disapproval of the popular press and soon disappeared from the market. Technical men said that these gasses were all right but that they contained some unsaturated fractions, olefines, etc., and that by eliminating the unsaturated fractions the color and odor could be eliminated. Our knowledge about olefines, saturated and unsaturated hydrocarbons, then was limited.

About this time there were vague articles on cracked gasolines. It was pointed out that if the crude oil that was being pumped into the regular stills was first passed through a long pipe at great pressure in the presence of great temperatures more gasoline could be obtained from the petroleum. It was regretted that this gasoline was often heavy, discolored, and offensive in odor, but the hope was extended that by various filterings and treatments these defects could be removed. The public demanded a water-white, odorless or sweet-scented gasoline.

The oil men reverted to straight run gas when they could get the crude to make it and when they couldn't get enough straight run gas they doctored the cracked gas, mixed it with aromatic fractions, natural gas gasoline, etc., and sold what was often called bootleg gas.

The World War brought on the threatened shortage of gasoline. The burden of supplying the Allies and our own great domestic market fell on our oil industry. New fields that would produce crudes of high gasoline content were sought out and developed at great expense. Finally they had to accept cracked gasoline in its most offensive form. So long as any gasoline would drive engines and didn't foul too much it could be sold at high prices.

Men of perception noted during those days of stress that it was the discolored, offensive gasolines that caused the least knocking and fouling in the engines of motor vehicles and aircraft. The merit of the cracked gasoline was recognized and great sums were spent to make it popular. Since the war the real cause of its anti-knock-ing qualities have been determined.

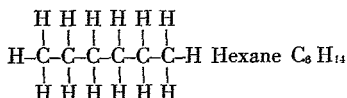
With this gasoline the special racing cars used in the International Sweepstakes Races at Indianapolis have been altered to such an extent that the next years entries are restricted to cars having only about 90½ cubic inches of displacement. The compression ratio is greatly increased and many of the cooling problems have been simplified. The compression ratio of the Ford engine is such that it requires 170 cubic inches displacement. This is now a large and inefficient engine compared with what the racing world and soon the public will demand.

The writer once equipped a Ford engine with a high-compression aluminum-alloy head, catalyzed it, and, with cracked gasoline altered by certain ingredients, made about sixty miles per gallon of gas on level concrete roads. The cooling and lubricating system of the engine failed when attempts were made to use this engine on heavy roads. There exists no doubt in his mind that if the bore had been smaller and the lubrication and cooling systems better the engine could do the same work it now does on half the gas.

An endeavor will be made to explain the difference between a saturated and an unsaturated hydrocarbon and to show why the unsaturated gasoline does not knock at the usual pressures and temperatures encountered in the usual run of engines.

The gasoline derived from Pennsylvania crude of paraffin base which is water white and of pleasant odor is a paraffin or saturated hydrocarbon. It is composed of carbon and hydrogen.

"They have the maximum percentage of hydrogen in relation to the carbon content of the molecule. The chemical constitution of the paraffin hydrocarbons is such that when chemically combining with air under pressure, the tendency is to explode at a high velocity instead of burning. The paraffin series are also termed saturated hydrocarbons, meaning thereby that the carbon atoms in the molecule have the maximum possible number of hydrogen atoms combined chemically with the carbon. The chemical formula is represented as $C_n H_{2n-2}$."

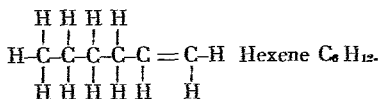


Others are Pentane— $C_5 H_{12}$; Heptane— $C_7 H_{16}$; Octane— $C_8 H_{18}$.

Note in the above how completely "hooked up" with hydrogen every carbon atom is.

"The olefine or unsaturated hydrocarbons are straight chain compounds having a chemical constitution differing from the paraffins. The unsaturated hydrocarbons when combining with air under pressure, have a strong tendency to burn slowly, rather than explode violently. The olefine or unsaturated hydrocarbons have two less hydrogen atoms for the same number of carbon atoms when compared to paraffin hydrocarbons of the same number of carbon atoms."

The chemical formula for the olefines is represented as $C_n H_{2n}$.



Some others are Pentene, Hexene, Haptene, etc. The formula for these are still in doubt.

On account of the fact that these olefine or unsaturated hydrocarbons have a tendency to burn slowly instead of exploding when subjected to temperature under great pressures, as proven by innumerable bomb tests, it is reasonable to conclude that a motor fuel composed of these entirely would not detonate in an ordinary engine. It is also reasonable to assume that a mixed gasoline that has a preponderance of cracked or unsaturated gas in it would take the characteristics of the olefines in burning under pressure.

Actual tests in engines and bombs show that under equal conditions of pressure and temperature the unsaturated hydrocarbons show the least tendency to detonate or knock.

There are certain saturated hydrocarbons that appear to disprove this, namely the naphthene hydrocarbons. These, however, have a different molecular structure, called the cyclic or ring structure. These act differently from the usual saturated hydrocarbons for reasons not well understood.

There are certain other hydrocarbons commonly known as the aromatic hydrocarbons. Among these are benzene and toluolene. The chemical formula for the aromatics is $C_n H_{2n-6}$, a study of which shows that it is gaunt in hydrogen. These are non-knocking fuels and are often used to adulterate paraffins to stop knocking or are put in olefines to deaden the odor and give additional volatility characteristics.

Shortly after the World War the public began to hear of hardened or saturated fats. Among these are Crisco and Snow Drift. These are lard substitutes. The hardening or saturation is effected by treating a hot vegetable oil, such as cotton-seed oil, with hot hydrogen gas in a retort under great pressure and temperature in the presence of a catalyzer, generally nickel oxide. The original oil which is unsaturated takes up certain hydrogen atoms and becomes a solid on cooling.

This is the basis of the hydrogenated or hardened fat industry. Every housewife is familiar with the product. The betrayal of this art, which was a British and American trade secret, before the World War was what saved the Germans from fat starvation. Some of their scientists developed a method of hardening the rancid, unsaturated fish oils from the Swedish Baltic fisheries and gave to them a rich lard and butter substitute which has, since the war, revived the menhaden fisheries of the world and greatly disturbed the dairy industry.

These synthetic, or hydrogenated, saturated fats are not stable. Under pressure in the presence of heat and in the absence of the catalyzer that caused their formation they break up explosively. This throws a new light on the whole subject of knock, and explains why the unsaturated hydrocarbons are the best for use in gas engines.

The writer has had abundant experience with the explosive nature of hydrogen gas. The hydrogen-oxygen explosion is one of the quickest and hottest there is. It is a high grade detonation. It can easily be seen that a hydrocarbon that started to dissociate—break up—would liberate some hydrogen atoms first to combine in a first-class or detonating explosion with the oxygen of the air. Any educated artilleryman knows that if we put a primer of detonating nature in a charge of explosive the whole mass is liable to detonate by taking up the detonating wave originating in the primer. Even smokeless powder held under suitable pressure will detonate if a piece of gun cotton or a large charge of mercury fulminate is set off in it.

The knocking or detonating in a gas engine is caused by the sudden change in molecular form of the motor fuel. If this change liberates hydrogen first, a detonating wave will be set up and the remaining charge will be detonated with such quick formation of heat as to overburden the bearings, unduly expand the piston, destroy the lubricant in the cylinder, and so strain the metal of the walls as to create vibrations.

Recent studies in catalytics have revealed the fact that clay is a potent catalyst. Clay is made up mostly of silicon and aluminum. Clay is in all shales. Most petroleum has been found in siliceous and clayey formations. The crude oils of nature have various percentages of saturated and unsaturated hydrocarbons. It is reasonable to suppose that petroleum, being of animal and vegetable origin, was first, like the animal and vegetable oils now used to make lard substitute, made up of unsaturated oils. These coming under the influence of clay, silicon sands, nickel

oxides, and other catalysts, became saturated with hydrogen derived from water and other sources, changed their molecular form, and wait only the right combination of heat and pressure to let go the hydrogen forced upon them. The ease with which nearly any crude oil can be cracked bears out this opinion.

The cracked, or unsaturated, gasolines are our best hope for an abundant gasoline supply. New methods are being devised all the time to break up the crude so as to get higher and higher percentages of motor spirits. Some processes get as much as seventy per cent of the gross input out as motor spirit. The petroleum of each field is a separate problem. Some of these gases will be stinking; others will be aromatic and pleasant to the smell. In the future we must not judge a motor spirit by its odor or its color nor by its specific gravity. We must accept it for its volatility and its non-detonating qualities under great pressures at high temperature. These temperatures and pressures complicate the cooling and lubricating problem, it is true, but then there is the steam cooling system to fall back on and, for the valves, the use of mercury jackets.

The oil industry is eliminating the odor by filtration in clay and fuller's earth. These processes to a certain extent clarify the gasoline to meet the fastidious tastes of pleasure motorists and satisfy the police regulations about smells.

Joint Army and Navy Exercises in the Panama Canal Department, 1926

The presence of United States naval vessels in Panamanian waters was made the occasion of joint Army and Navy exercises during the recent dry season. On January 15, the Control Force of the U. S. Fleet was opposed in simulated warfare by local naval forces and all army troops stationed on the Atlantic side. The enemy was held at a distance by the coast artillery, and prevented from making a "run-by" by submarines stationed at the breakwater entrance.

On February 3-4, the U. S. Scouting Fleet arrived from Guantanamo and made a hypothetical attack against all available defenders within the Canal Zone garrison. The various elements of a major effort were involved. Bombardment and landing operations were simulated. Smoke screens were employed. The hostile aerial service was especially active and by a simulated bombing of France Field and Coco Solo, prevented the defending planes from taking the air while the fleet was actually attacking. During the exercises the airplanes from France Field maintained night patrol.

After the naval phase was completed, the mobile beach defense forces were assumed to have been hostile forces which had succeeded in landing. These at once marched against the Canal and spirited land maneuvers resulted.

The conclusions drawn from the exercises were:

a. The garrison has proved to be highly efficient in defending the Canal, but inadequate in numbers.

b. The plans for defense are sound.

c. The fortifications, as projected, should be sufficient, when completed, to resist naval attacks in the present stage of naval development.

d. The Air Service of the Canal has proved to be inadequate in number of men and amount of materiel to meet successfully an air attack which an enemy could bring against the Canal.

After the joint exercises the Control Force and the Scouting Fleet passed through the Canal and joined the Pacific Battle Fleet in grand maneuvers.

Training the Fire-Control Sections

By MAJOR C. O. SCHUDT

Coast Artillery Corps

Training fire-control sections has always presented difficulties, especially in the National Guard. In the Regular Army it has been possible at times to use a commercial vessel as a target and at others to provide a tug specially for this purpose. In the National Guard, the only time training could be engaged in—except with hypothetical data, admitted to be unsatisfactory—was during the first week of the field training period.

A study of the problem indicates that, in actual firing, a fire-control section is governed by a visible point (the target) which changes its azimuth with respect to each of the base-end stations by a slightly increasing or decreasing amount between

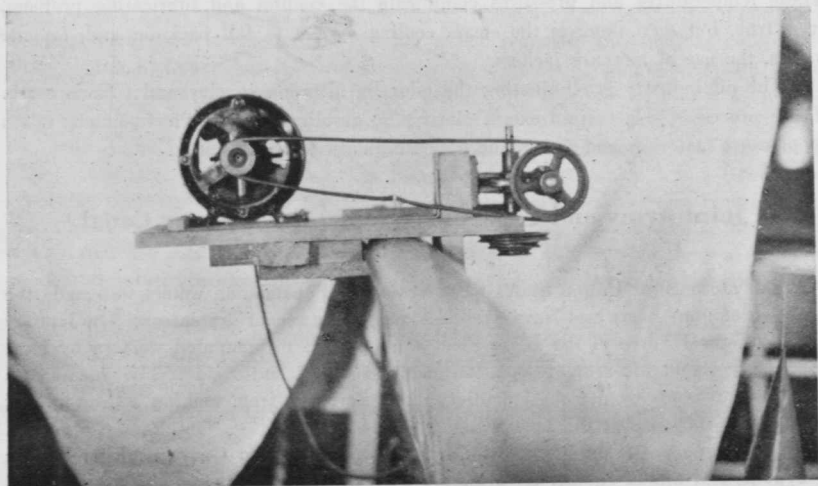


PLATE A

successive observing intervals. It is only necessary to reproduce, in miniature, the foregoing sequence of events to permit training to be carried on in an armory, on the parade ground, or even in squad room.

The following is a description of a device which has proven satisfactory and is now being used in the armory by the 245th Coast Artillery, New York National Guard. Plates A and B show the power or driver end of the apparatus, the essential parts of which are a motor with a reduction gear terminating in a set of grooved cone pulleys revolving about a vertical axis.

Plates C and D show the driven end of the apparatus, consisting essentially of a single-grooved pulley with low-friction bearings mounted on a slide so that it can move towards or from the driver but tending to move away from the driver due to the influence of a weight caused to act horizontally by means of a small pulley and cord.

Plates E and F show general views of the driver and driven ends respectively.

The driver and driven ends are connected by a fishline which acts as a belt and supports the targets which are suspended therefrom by cords of sufficient length so that the targets will easily negotiate the turns at each end.

If both ends of the apparatus are now set up about twenty yards apart and the motor is started, we have a moving target in miniature but the successive courses will differ from each other only by the diameter of the pulleys on which the fishline acts

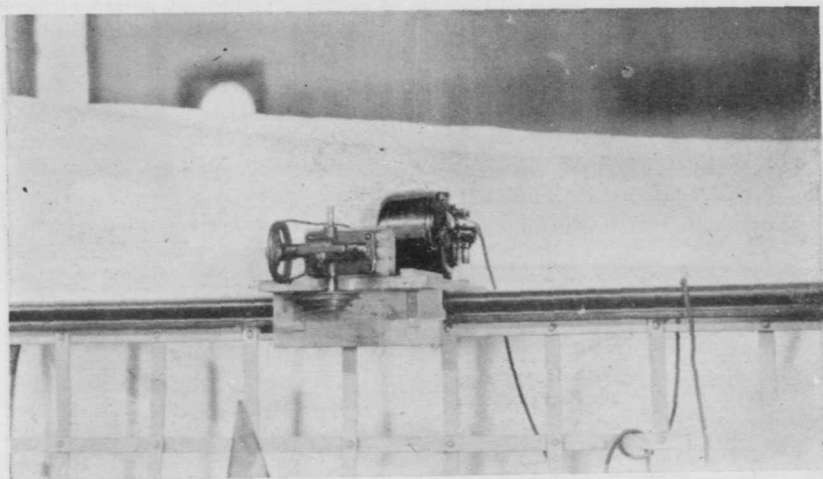


PLATE B

as a belt. But if either end is arranged so that it can be displaced in a direction at right angles to the line joining the two ends any number of courses are available.

The slide on which the driven pulley is mounted and the weight perform the dual function of automatically keeping the belt taut and permitting variation in distance between the two ends due to displacement of either end to change the target course.

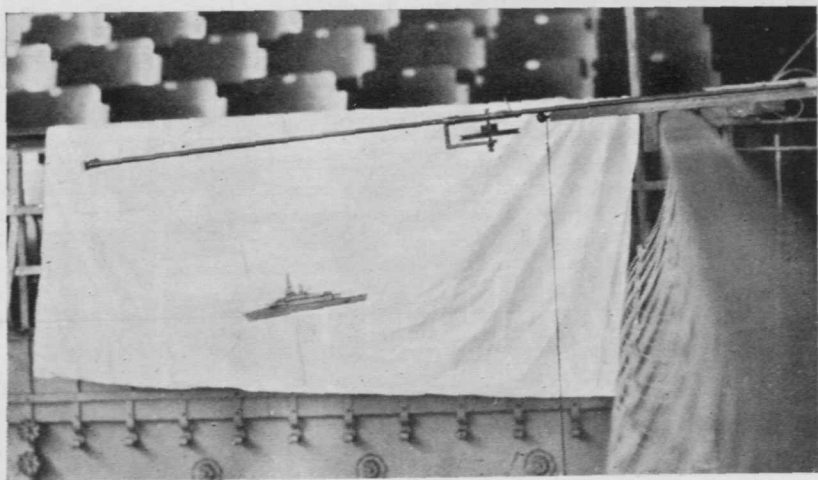


PLATE C

The apparatus shown is arranged so either end can be displaced along the railing of the gallery. It is only necessary to arrange one end for displacement and it is generally most convenient to so displace the driven end.

The location chosen for the apparatus should be either in a building or other sheltered locality where the distance between the ends can be at least fifty or sixty feet and where the azimuth instruments can be set up not less than thirty-five feet

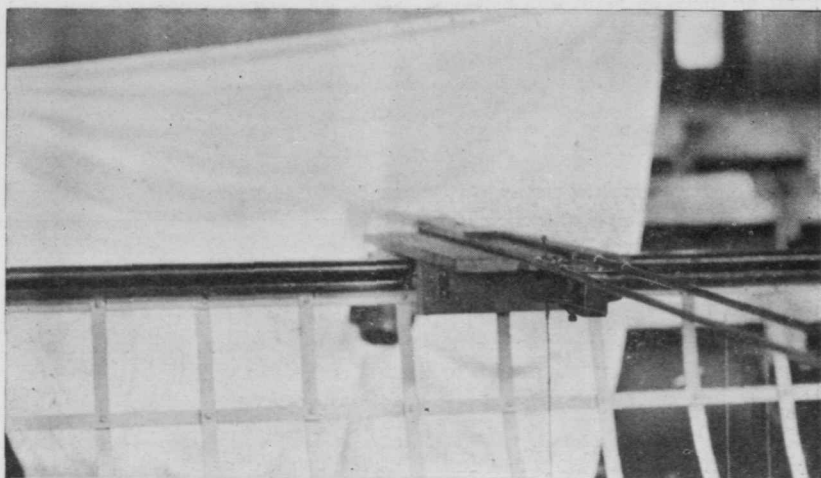


PLATE D

distant measured on a perpendicular to the line joining the two ends. When the azimuth instruments are too close to the targets difficulty is met with in focusing the telescopes.

The speed reduction necessary depends on the location of the apparatus and it must be kept in mind that the idea is to provide a moving point (a target) which

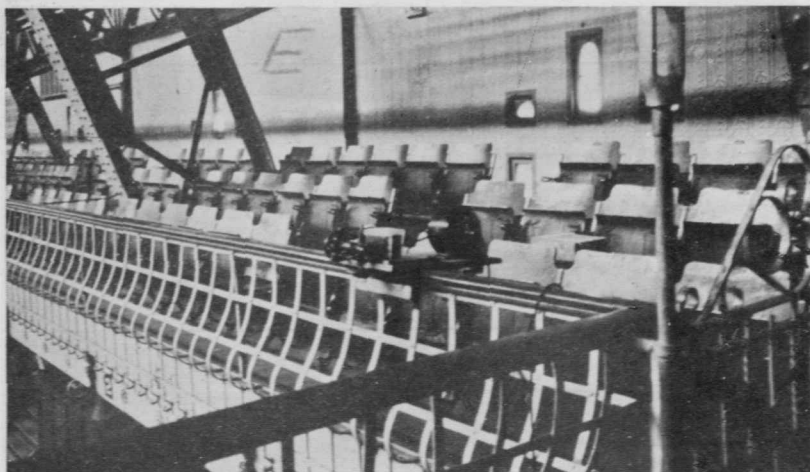


PLATE E

simulates a vessel, whose azimuth from the base end stations varies a sufficient angular distance between observing intervals so that a logical track can be plotted. Datum points can be set up but their azimuth must have an approximate relation to the plot-

ting board used. It is not necessary that the base line be accurately laid out nor that the orientation be anything more than an approximation. (Accuracy is only necessary when it is actually intended to fire a gun using the data obtained.) Any desired range on the plotting board can be obtained by merely changing the horizontal distance between the observing stations.

The plotting room and BC station should be set up in close proximity to the apparatus and the necessary telephone communications and time-interval signals improvised. Field telephones can be used throughout with head sets wherever necessary.

Gun crews can also be trained using Case III with the data obtained from the apparatus, all that is necessary to accomplish this being the necessary communications. Case II training can also be carried on if the locality permits of emplacing a 155-mm. gun in close proximity to the observing stations.

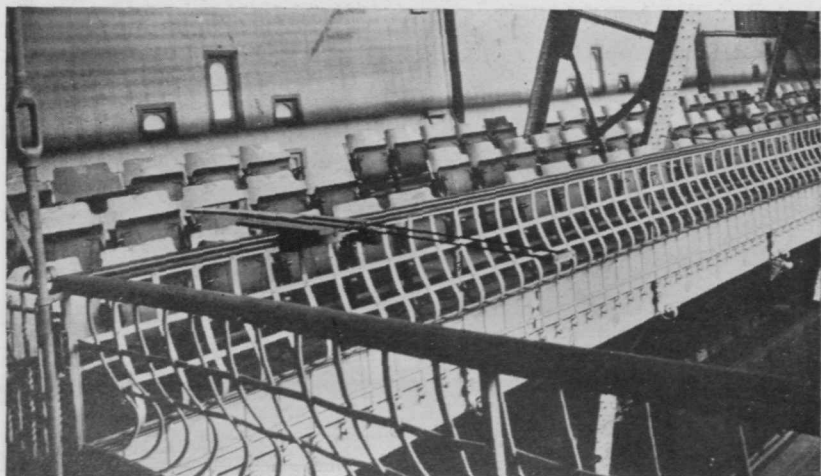


PLATE F

Only a simple form of apparatus has been described. The targets used are generally paper cones, colored, and of a size to simulate a standard pyramidal target. Plate C shows the silhouette of a ship being used as a target. A curved track can be provided by devising a mechanical means of imparting motion to the apparatus of either end while running. In all cases the driven pulley should be quite large as this reduces its friction and increases its inertia, both aiding in steady travel of the target.

The apparatus is also adaptable for use in training anti-aircraft fire control sections, the two ends in this case being mounted on elevated supports at least thirty feet above the ground. Displacements of one end to vary the track is more difficult in this case, but is not absolutely necessary. However, in using a double-sight instrument at such short ranges difficulty may be experienced in keeping the target within the field of both eye pieces and it may be necessary to use two identical targets separated from each other by a distance equal to or slightly greater than the distance between the eye pieces.

NOTE.—The speed reduction unit shown in Plates A and B was obtained from the Boston Gear Works Sales Company, Norfolk Downs, Mass. It has a reduction ratio of 48 to 1 and is similar to their BU-2 shown in their C 10-25 catalogue.

Field Training of the 244th Coast Artillery

By CAPT. C. H. ELLARD
244th Coast Artillery

EDITOR'S NOTE.—The 244th Coast Artillery (155-mm. guns) is the old Ninth New York and, as such, traces its history back to 1789. In consequence, every effort is made by the personnel of the regiment to maintain the esprit de corps and the efficiency that the brilliancy of its past record justifies.

The first encampment of the 244th Coast Artillery, in which the regiment, as tractor artillery, really had to shift for itself, began when we entrained for Fort Ontario, Oswego, three hundred and fifty miles from our home station, at about 9:00 P. M., August 1, 1925. It was, for most of the men, a second experience at entraining, so that when they marched to the N. Y. C. R. R. yards at Thirty-fourth Street and Tenth Avenue, they were quickly aboard the two sections and on their way



GUN PARK, 244TH COAST ARTILLERY

to camp. About nine o'clock the next morning the trains pulled into Oswego, N. Y., and Fort Ontario heard the tramp of the visiting troops going into camp on the northern side of the old fort. The infantry garrison had been temporarily sent elsewhere, so the 244th spent their two weeks as the sole troops at the fort. Many of the post officers were still there and saw to it that nothing was lacking in the way of comfort and entertainment.

Sunday afternoon was spent in settling down, and bright and early Monday morning, the gun crews, plotting room sections, and all headquarters details were on the job. Materiel, guns, tractors, etc., were issued to the batteries. Details were put to work getting out the telephone lines, making the necessary surveys, etc.

The tractors and guns were on the way to the emplacements by mid-afternoon. The quiet suburban road assumed a decidedly warlike aspect as trucks and tractors and guns, with their crews, trailed along the road to the emplacements, two and a half miles from camp, on the lake shore. The farm roads were not the best and needed "some negotiating" in spots. The tractors and the guns were original packages, just as they arrived at the fort from the arsenal. Some of the former "acted up" and one "laid down" about half way out, but a "reserve" was sent out and the gun was well on its way before dark. By Tuesday night all guns were emplaced.

The First Train and Battery "E" tied for the pennant for the best guard mount; Headquarters Battery took the pennant for sanitation, with Batteries "F" and "E" close up; Battery "E" qualified the most men at small arms practice; and the artillery work of Batteries "C," "D," "E" and "F" was good.

The target reports had to be made up without photos as the weather and the time of day did not permit a full set to be taken. Battery "E" was fortunate enough to place the center of impact of all salvos on the hypothetical target, securing eight hits in four minutes from four guns, or one-half hit per gun per minute, and received a special letter of commendation from the Commanding General, Second Coast Artillery District.

SUMMARY

The regiment entrained, with a good percentage of the enlisted personnel present, a thing much more difficult in a big city than one would think, and made an overnight train trip of over three hundred miles. It then drew and checked the materiel as issued by the arsenals; installed three four-gun batteries, each with its own independent base line, plotting room, communication and T. I. systems, complete; conducted the preliminary tracking practice and fired eight units in service practice. It then evacuated the positions, cleaned, checked, and turned in the materiel and equipment, broke camp, entrained with vehicles for an overnight trip back, detrained, paid off, and returned equipment to the armory. What more could be expected of a lot of city chaps in two short weeks?

Noncommissioned Officers

Speech of the HON. ROBERT L. BACON of New York

IN THE HOUSE OF REPRESENTATIVES, FRIDAY, FEBRUARY 12, 1926

[Reprinted from the *Congressional Record*]

The House had under consideration the bill (H. R. 8917) making appropriations for the military and nonmilitary activities of the War Department for the fiscal year ending June 30, 1927, and for other purposes.

Mr. Chairman, unnoticed by many of the Members of the House, a provision of the appropriation bill was adopted yesterday in such a form that it would reduce the pay of the enlisted men of the Regular Army by \$988,659. It is proposed to keep the same number of enlisted men that we now have in the current fiscal year, but there is to be this sweeping reduction in their pay.

In order to do this it will be necessary for the War Department to stop all promotions among the enlisted men of the Regular Army for a year or more. During this period no enlisted man in the Regular Army can hope for any advancement. It is unnecessary for me to enlarge upon the demoralizing effect that this will have on the morale of this class of men who carry on in time of peace in our national defense system. If the enlisted men of the Regular Army were organized in some society which employed a high-salaried publicity man, the papers would be filled with the accounts of the outrages that are being perpetrated against the enlisted men of the American Army.

I am making a plea for justice to a voteless Regular Army. Aside from justice to the enlisted men of the Regular Army, the bill, in its present form, will deprive the National Guard, Organized Reserves and colleges with Reserve Officers Training Corps units of the services of an efficient corps of noncommissioned officers. Two years ago, after extensive hearings, the Senate and the House passed a bill increasing the per-

centage of noncommissioned officers in the Regular Army. This was for the purpose of furnishing additional noncommissioned officers for the training and instruction of the National Guard, Organized Reserves, and the Reserve Officers Training Corps.

Now, in the appropriation bill pending before the House, this bill is in effect repealed. The Army of the United States and especially its civilian components are to be gradually deprived of these noncommissioned officers. The noncommissioned officers have frequently been referred to as the "backbone" of the Army, and they are. Anyone who has served in the World War will testify to this. Now, it is proposed to weaken or break the backbone of the Army.

Under the national defense act this country is maintaining a small Regular Army. At present it is a very small Regular Army, indeed, when we take into consideration its functions. Being small, it should be of the highest character. We need a high type of noncommissioned officer and enlisted man in the training camps to instruct and associate with the young men who attend these camps in the summer. I think it is poor economy to reduce the pay of the enlisted man of the Regular Army and thus lower the standards of efficiency. Under our democratic training system we are making greater demands of the Regular Army than ever before in the history of the country. General Pershing has referred to the Regular Army as the faculty, the instructing corps of the Army of the United States. The last thing we should do is to lower the standard, especially of the noncommissioned officers and those men whom we will call upon to serve at colleges and training camps, and I appeal to the House to do justice to the enlisted men of the Regular Army and to keep up the standards of its enlisted personnel, so that it can function efficiently at the colleges and in the training camps.

In the hearings before the subcommittee of the House Committee on Appropriations this "saving," as stated by War Department officials, involves the reduction in grade of 1471 noncommissioned officers, 1496 privates first class, and 1380 specialist ratings. In order to effect the reduction of these soldiers from the higher grades the plan of the War Department will be to stagnate promotion until these numbers are absorbed.

It is not a fact, as has been stated, that this is the desire of the War Department, and that they believe that the Regular Army is top-heavy in noncommissioned officers. On the contrary, if officers testifying had not been bound to the act of Congress prohibiting their asking for more money than allowed in the Budget as submitted to Congress, they could have explained wherein these extra noncommissioned officers are urgently needed. Secretary Davis did say the following:

There has been and is continually, increasing demand particularly from the civilian components, for more officers and noncommissioned officers for their training. It will affect them and it will affect the Regular Army to a certain extent. But this—the recommendation of the War Department under the fixture of the specific sum for pay of the Army by the Director of the Budget—was done in order to keep within the figure of 118,750 men. It was a question of either reducing some of the higher-paid men or cutting down the number, and that was the reason for the reduction.

Two years ago Congress passed an amendment to the National Defense Act increasing the proportion of the higher-paid enlisted men, so that an increase of approximately 1800 noncommissioned officers was made. At the time of the extensive hearings on the bill by the Committee on Military Affairs, the Regular Army had a strength of approximately 112,000 enlisted men, exclusive of Philippine Scouts; today the strength is about 118,000. The reasons for the passage by Congress of the

increased number of noncommissioned officers exist today even more urgently than when the increase was made in 1924. The increase was made primarily to carry out instruction in the civilian components of the Army; that is, the National Guard, the Organized Reserves, and the Reserve Officers' Training Corps.

In the report of the bill increasing the noncommissioned officers in the sixty-eighth Congress, Mr. Wainwright reported:

A question of the greatest importance has to do particularly with the fulfillment of the obligation imposed upon the Regular Army in connection with the training of the civilian soldiery in the National Guard, the Organized Reserves, and in the Reserve Officers' Training Corps. A part of the noncommissioned officers herein provided for will be detailed as instructors of the National Guard in towns and cities where National Guard organizations have been formed, in educational institutions maintaining units of the Reserve Officers' Training Corps, and with the Organized Reserves.

It is evident that the type of noncommissioned officers performing this duty—in daily contact with the youth of the Nation, molding his character to a large degree—should be of the very highest type. The War Department feels, and your committee concurs in the view, that this can not be successfully done unless the noncommissioned officer is given a grade and compensation sufficient not only to attract the right type of men but to enable them to live in civilian communities in a manner creditable to themselves and the work in which engaged.

In the matter of overhead of the Regular Army it is interesting to note what is being carried in the way of noncommissioned officers as instructors. These noncommissioned officers must be additional to those essential for Regular Army organizations and other overhead, such as for the recruiting service, and so forth. The authorized strength given below is being maintained practically as authorized:

With National Guard, noncommissioned officers of grade of sergeant or above; no lower grade of enlisted men	601
With Organized Reserve, noncommissioned officers of grade of staff sergeant or above; no lower grade of enlisted men	535
With Reserve Officers' Training Corps, noncommissioned officers of grade of sergeant or above; no corporals	537
Noncommissioned officers, all sergeants or higher grades	1673
153 privates, first class; 346 privates	

The replacement of five per cent of these high-caliber men, who by their pay are able to maintain themselves on the important duty as instructors, by privates will work a hardship on the civilian components that will be detrimental in no small degree to the entire national defense project.

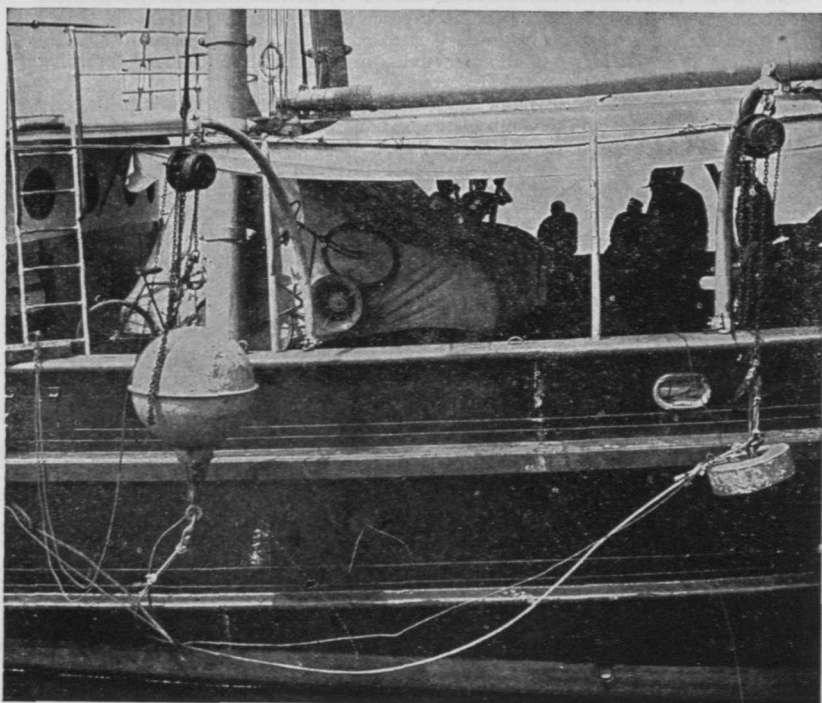
Noncommissioned officers are the backbone of the Army has often been said. To get good ones there must be incentives for reenlistment, as reenlisted men are the materiel for the noncommissioned officers. Men of high type will reenlist only if there are incentives, and under present conditions in the Army, with the poor living quarters, inadequate rations, and excessive labor, made necessary by scanty appropriations of funds, the problem of inducing good men to reenlist is almost insolvable. Now, add to this the stagnation of promotion and there will be fewer reenlistments and there will be more purchasing their discharges. The caliber of the men will necessarily fall below the average now maintained.

Every component of the Army of the United States is going to feel this reduction. Numbers are oftentimes unimportant as compared to quality. Adequate number of men of high quality are necessary for the maintenance of our national defense system.

The Army Mine Planter Service

[Reprinted by permission from *The Recruiting News*]

By virtue of its many activities the Coast Artillery Corps is one of the most versatile of all the branches of the Army. Although it is best known as the "Big Gun Corps," it also mans the smaller-caliber weapons in defending its mine fields and protecting the shore against landing parties. Its mining activities include the operation of the Mine Planter Service, and it is with this phase of its work that this article is primarily concerned.



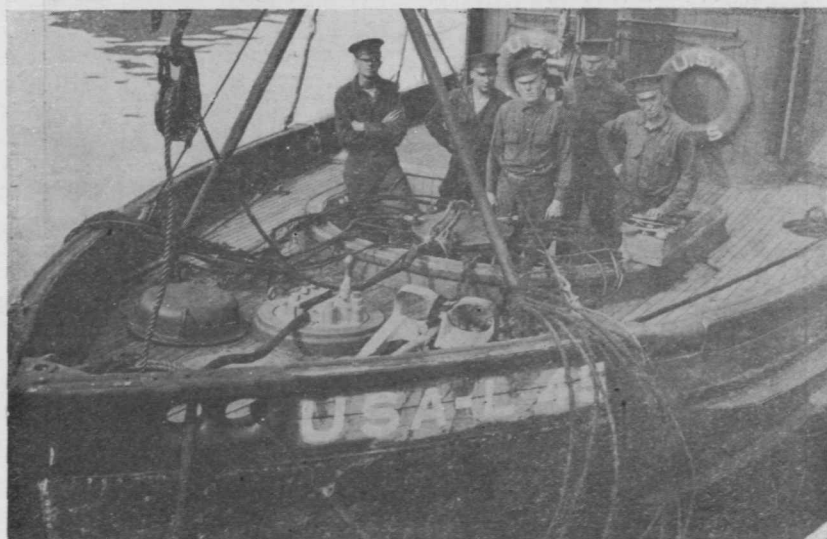
MINE ASSEMBLED READY FOR PLANTING

As early as 1901 it was realized that if a harbor were adequately defended by an efficient system of mines and the requisite guns for the prevention of countermining, sweeping, or other methods of removing them, any enemy, however enterprising, could never force an entrance with large ships. This conclusion has since been strongly supported by the destruction wrought by the submarine mines during the Russo-Japanese War and the World War. Being under complete electrical control from the shore, a line of mines may be rendered instantly destructive to an enemy or harmless to a passing friendly vessel.

In 1903 there were no facilities for planting mines at any Army post except Fort Totten, New York, where a school of submarine defense had been established. Improvised mine planters were sent out from this base to various harbor defenses to disseminate knowledge of submarine mining. Practical instruction in mine laying and training was given in each harbor visited.

The boats for this purpose were provided by the Quartermaster Department, and consisted of the steam lighter *Williams*, *The Dyne*, a launch originally built by the Engineer Department, and five yawls to be used at the Submarine School. Later it was found that the *Williams* was not well suited for mine work, while *The Dyne* was worth only such general repairs as would enable her to be used until another boat of the same type could be built.

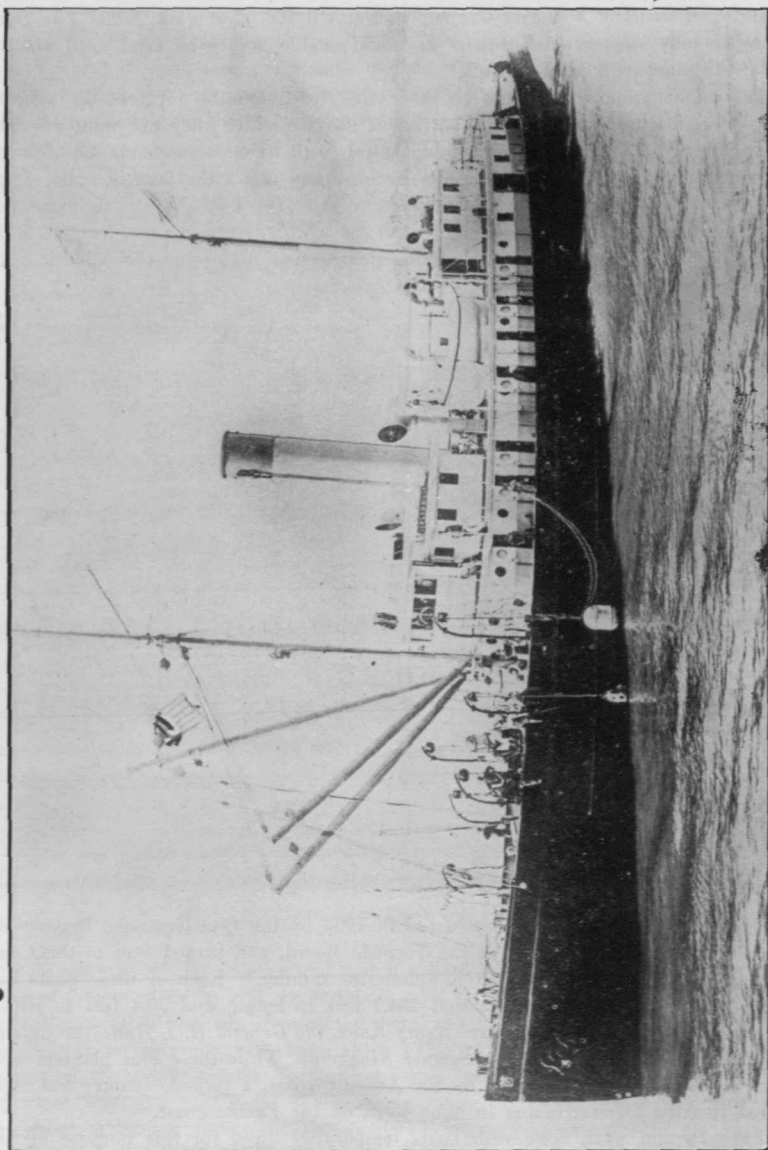
Recommendation were therefore made that these two be replaced by suitable boats, "designed and built for the particular use for which they are wanted." The lighter was to be a twin-screw, sea-going vessel, with living accommodations for two officers and twenty enlisted men besides her ordinary crew; the launch to be of the same general type as *The Dyne*. In addition to these two boats, it was recommended that at least three more sea-going lighters of the *Williams* type be constructed, to be used in submarine work at various harbor defenses; two for use on the Atlantic coast and one on the Pacific coast.



D. B. BOAT SHOWING DISTRIBUTION BOX.

Four mine planters were constructed in 1904 by the Quartermaster Department in accordance with the designs of the Torpedo Board, and turned over to the Coast Artillery "for instruction purposes in submarine mining." Each of these boats had a displacement of 630 tons; measured 134.7 feet in length and 30.4 feet in width. They were designated as the *General Henry Knox*, the *General H. J. Hunt*, the *Colonel George Armistead*, and the *Major Samuel Ringgold*. While these four planters were sufficient for instruction purposes on the Atlantic coast, a torpedo planter was most urgently needed for instruction in mine work on the Pacific coast.

Experimental work done with boats temporarily hired for this purpose at San Francisco, California, showed clearly the urgent need of a torpedo planter for instruction purposes on that coast. Each planter soon became to be considered as an essential part of a harbor defense, a definite part of the fighting materiel, as much in fact, as a battery, and the crew of a mine planter was regarded as a manning body for that planter in the same sense as the personnel necessary to fight a battery was considered as the manning body for that battery. Other considerations arose which made



ARMY MINE PLANTER PREPARING TO PLANT MINES

evident that the number of mine planters should be increased. To have effective artillery practice, the range sections should be exercised daily by vessels towing targets at such a rate of speed as could be expected in action; frequent subcaliber target practice at towed targets; transportation of materiel and artillerymen to the batteries and range-finding stations. It was apparent from these conclusions that without such boats, the Coast Artillery would be greatly handicapped. The records of artillery target practice confirmed this, showing that the highest scores were made at posts which had the best facilities for vessel tracking.

To provide for the necessity the Quartermaster Department, keeping within the limitations of appropriations, constructed during the period 1904 to 1909, five mine planters of 630 tons displacement each; one of 830 tons displacement; three of 800 tons each, and fourteen auxiliary mine planters of 225 tons displacement each.

Of the ships then constructed there remain in the service today: the *General E. O. C. Ord*, built at Wilmington, Delaware; the *General J. M. Schofield*, built at Camden, New Jersey; the *Colonel George Armistead*, built at Philadelphia, Pennsylvania, and the *Joseph Henry*, built at Newport News, Virginia.

At an early date the Coast Artillery was confronted with the problem of supplying suitable crews to man its vessels. Difficulties were constantly encountered in both the engineer and steward departments, partly due to the fact that the duties of the personnel were not fully understood, especially since the ships were the first of their kind.

Then too, the men of the crews, being civilians, quit whenever they pleased, and at such times the work of the mine planters was seriously handicapped. At times, from total lack of personnel, the vessels were unable even to leave the wharves. So soon as disciplinary measures were applied to the crews, when the planters were engaged in difficult work or were held at any station or in any climate that was disagreeable, the individual members quickly sought other work.

Various methods of combating this evil were attempted but a satisfactory substitute was not found until it was recommended that legislation be enacted providing that mine planter personnel constitute a part of the enlisted force of the Coast Artillery Corps. The determination to develop efficient crews resulted in the establishment of the Army Mine Planter Service in the Coast Artillery Corps by the Act of Congress approved July 9, 1918.

The operation of the planters is of too technical a nature to be entered here; suffice it to say that the mine companies of the Coast Artillery Corps are charged with the actual planting of mines and the defense of the mine fields. To accomplish the former, the ships travel from post to post in their several districts; for the latter, the mine companies are supplied with artillery of various calibers which they man and operate. The work of these companies is equally divided between shore and sea duties.

There are many opportunities for advancement in the Mine Planter Service as well as for travel. Enlisted men are given preference in the appointment of warrant officers who receive the following yearly base pay: Master, \$2220; First Mate, \$1690; Second Mate, \$1308; Chief Engineer, \$2100; and Assistant Engineer, \$1440.

Ordinarily the navigation duties of the ships' officers are mostly routine and call for nothing except a general knowledge of harbor and inland water piloting in the vicinity of their immediate station. There are occasions however, when these ships are called upon to perform long journeys, the unexpectedness of which makes them more difficult than those encountered on inland boats of much larger tonnage and greater navigating radii. Foremost of these journeys is the trip of the United States Mine Planters *General Henry J. Hunt* and *General Henry Knox* to the Philippine Islands upon their assignment to the Coast Defenses of Manila and Subic Bays, Fort Mills, P. I.

Under the command of First Lieut. Maxwell Murray, Coast Artillery Corps, the planter *Hunt* and the planter *Knox*, in command of First Lieut. Wm. E. Shedd, Jr., Coast Artillery Corps, sailed from New York, December 1, 1908. Sailing by way of the Suez, the following calls were made: Funchal, Madeira Islands; Gibraltar; Island of Malta; Port Said; Aden, Southern Arabia; Bombay, British India; Colombo, Island of Ceylon; and Singapore; arriving at Manila, March 25, 1909.

The same year, the Mine Planter *Colonel George Armistead*, now on duty in the Harbor Defenses of San Francisco, California, and the *Major Samuel Ringgold*, no longer in the service, sailed from New York City for San Francisco, California, by way of the Straits of Magellan. Captain F. K. Fergusson, Coast Artillery Corps, was in command of the *Armistead*, and the expedition, and First Lieut. C. L. Corbin, Coast Artillery Corps, was in command of the *Ringgold*. This expedition left New York on November 24, 1909, making the following calls: San Juan, Porto Rico; Bridgetown, Barbadoes; Para, Brazil; Pernambuco, Brazil; Rio De Janeiro, Brazil; Montevideo, Uruguay; Punta Arenas, Straits of Magellan; Talsahuana, Chile; Callao, Peru; Panama, C. Z.; San Diego, California; arriving at destination, San Francisco, California, April 28, 1909.

The officers of this expedition were presented upon their arrival in Peru to the President by the American Minister at Lima. They also visited the military school and the Peruvian warships. The courtesies were unique in that they were perhaps the only such honors ever extended an Army officer in command of a United States vessel while visiting a foreign harbor.

The fact that these four vessels completed their long voyage in good condition and without accident is a strong testimonial to the efficiency of the vessels, their crews, and the officers who commanded them.

Coast Artillery R. O. T. C. Camps

About 700 Coast Artillery R. O. T. C. students comprising eighteen educational institutions throughout the country will be trained during the 1926 encampment season. Definite decision has already been made as to the location of three of these camps, namely, Fort Monroe, Va.; Fort Barrancas, Fla., and Fort Funston, Calif.

The camp at Fort Monroe, which will begin June 11 and conclude July 22, will be attended by students from the following institutions: University of New Hampshire, Massachusetts Institute of Technology, University of Pittsburg, Virginia Polytechnic Institute, University of Cincinnati, University of Michigan, and Michigan Agricultural College. This camp will be attended by about 375 students.

The dates of the Fort Barrancas camp are the same as those governing the camp at Fort Monroe. Only four schools will be represented at the Florida camp, the attendance being estimated at about 150. Students from the following institutions will be given instruction at the Florida camp: Mississippi A. and M. College, Georgia Tech., University of Alabama, and the Citadel.

The camp at Fort Funston, which will begin on June 18 and conclude July 29, will be attended by about fifty students from the following schools: University of California, University of Washington, Utah Agricultural College.

As in the past, the War Department hopes to hold another camp at Fort Monroe to be attended by students from the University of Minnesota, Washington University, Kansas Agricultural College, and the University of Kansas, but with the reduction in mileage funds it is extremely doubtful that this camp can be held at Monroe. If the budget interferes, the camp will probably be held at Fort Sill, Okla. About 125 students are included in this group of schools.—*Army and Navy Register*.

Coast Artillery School Library

BOOKS CATALOGUED

Unless noted thus "*" these books may be obtained by any Regular Coast Artillery Officer; Warrant Officer, A. M. P. S., or Noncommissioned Officer (Grades 1-3), C. A. C., upon request to the Librarian, C. A. S. Library.

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Foreign Periodicals

WAR IN THE PACIFIC.—In the January number of the *Empire Review* there is an article on "The Chances of War in the Pacific," notable principally because of the man who wrote it, Sir Frederick Maurice. It gives a short review of the general talk of war before the Washington Conference, of the work of that Conference, and of the effect of the resulting Treaties. No new points are brought out. Sir Frederick has evidently read Bywater's recent book, but will have none of it. He thinks Japan is secure in the Western Pacific, and will never risk war with us or put herself in the position of the aggressor in the face of the Washington Treaties and of the Covenant of the League. In spite of the restrictions on armaments imposed by the Washington Treaties, "the argument that the separation of naval bases by a sufficient space will, of itself, prevent naval war has always seemed to me to be somewhat thin." But "a war between the United States and Japan would be a war between that one of the Great Powers which has the largest supplies of raw material and the most highly developed industries applicable to the purposes of war and the Great Power which has the least of both."

Perhaps the most significant thing about the article is his mention of Great Britain in his summing up. All the way through he has been talking about a war between Japan and America, but at the last he says that "a Pacific war in the sense

of a war involving the United States and Great Britain is among the least probable of the dangers to which the world is at present exposed"—an unconscious admission, I think, that Japan could not fight us without also fighting the British Empire.

INCREASE IN CASUALTIES BY ARTILLERY FIRE IN MOST RECENT WARS.—In *Militär-Wochenblatt* for September 25, 1925, we note the following on this subject: in the Franco-German war, 1870-71 it was 7.5%; in the Russian-Japanese war, 1904-05, 15%; in the World War of 1914, 65%; with the German troops in front of Verdun in 1917, 72.2%; with the German troops in Picardy in 1918, 51.5%; with the Americans in the World War, 80%. Casualties caused by gas are not included in the foregoing figures. Those were, toward the close of the war, very great because artillery fire was more and more used with gas. On account of the powerful effect of modern artillery, the army organizer no longer figures on how many guns shall come to a thousand infantry but upon how many infantry men will be sufficient to exploit the fire effect of the artillery mass fire.

SHELL OR SHRAPNEL.—There is in the Austrian *Militär-Wissenschaftliche und Technische Mitteilungen* for September-October a brief notice of an article written by Captain Ritter and published in *Artilleristische Monatshefte* on this controversial and much discussed subject. The author, in passing judgment places the main importance on the influence of modern infantry tactics as a solution of the artillery's part in the premises: namely, overcoming enemy infantry. The infantry, advancing in more or less dense lines, was formerly the principal bearer of the burden of the fight. It was therefore necessary to put as many as possible out of action as quickly as possible, and shrapnel was the best means of accomplishing this. Today the fire effect of infantry is transferred to machine guns; it has, therefore, become the part of the artillery to destroy these irregularly distributed and not easily discovered machine weapons. Flat infantry directed fire has become direct aimed fire and to oppose this now requires a projectile with limited but powerful explosive effect—the percussion fuze shell, rather than the former wide covering effect of the shrapnel. The machine gun accompanying infantry not taking direct part in the fight can still be reached with the flat-trajectory shrapnel, but machine gun weapons are still better adapted for that, hence, the author thinks, the equipment of the artillery with shrapnel is no longer justified.

THE CAVALRY IN THE PALESTINE CAMPAIGN.—In discussion of this subject by Major O. Welsch in the *Schweizerische Vierteljahr Schrift für Militärwesen*, concluded in the third issue for 1925, the writer summarizes his conclusions by saying:

Taken all in all and looked down upon from above, the Palestine Campaign was a combat of the three giants: Capital, Industry and Technique against the primitive nature of man and the camel, the outcome of which was never in doubt. On one side abundance and rigid organization overcoming all difficulties of the region, on the other want and improvisation inadequate for overcoming even perplexities arising from day to day to say nothing of those occasioned by the enemy. In a purely tactical sense we can, however, assert without exaggeration that England won the war in Palestine principally with its own and with its dominions' cavalry forces. The outcome might, in all probability, have been quite different if Turkey could have been in a situation to oppose with a weapon of equal strength. A doctrine that is deserving of serious consideration in view of the attempts, emerging after every war, of denying to the cavalry its right to existence as a war weapon.

THE VALUE OF PERMANENT FORTIFICATIONS.—Referring to a work written by the Italian general, A. Gasca, and published in 1925, on this subject, a writer in the

Militär-Wochenblatt for December 18, 1925, gives a brief summary of the book as follows:

The question of permanent fortifications is still a matter of controversy with all military states. The success of the Germans against the fortified places of their opponents have given occasion to many military writers to cast doubt upon the value of permanent fortifications. The Italian author takes upon himself the task of throwing some light upon the fundamentals of the question at issue. His conclusion is: "the permanent fortification has not yet outlived its usefulness. The safety of a state is best assured by a combination of rigid and mobile defense—one supplements the other. The permanent fortification conserve forces and by that means facilitates operations—the offensive. The principal reasons for the apparent discredit of permanent fortifications with the powers of the entente is due to their enormous cost and the further fact that they did not make proper use of them in the last war. It is preferable to have no fortifications rather than to have poor ones and those badly defended.

"There is no normal for fortifications. The method and design of fortifications is, aside from tactical and strategical points of view, decided wholly by the conformation of the terrain and its environment. The important features are not armor but concealment from sight, not layouts bidding defiance to an enemy but those that evade him. Fortifications will prove their value in the future as they did in the past only when they are adapted to the permanently progressive offensive powers of the nation and are defended by the best troops under command of prominent personalities. The man alone can give life to the dead mass and transform it to success."

THE PRELIMINARY DISARMAMENT CONFERENCE.—In the February 4, 1926, number of the *Militär-Wochenblatt* the well known author and critic who writes under the pseudonym of "Lucius Cincinnatus" takes up the subject of the "agenda" or protocol that has been prepared for representatives of the various nations concerned that are to take part in the preliminary disarmament conference that was to meet at Geneva in February as first proposed but later postponed to sometime in May of this year. These "agenda" cover seven fundamental questions with numerous sub-sections to each. They are given in full detail by this writer and may be found in a much condensed outline at the bottom of page 721 of the *Current History Magazine* for February, 1926.

The writer in the German military journal makes some sarcastic comments on the questionnaire and the several questions and on their general purport, but says that the peculiar situation of uncertainty of outcome should not prevent us from giving our undivided attention to the progress and eventful issue of the discussions which are of such vital importance to every military man. He further says: "It requires neither profound military knowledge nor capacity for political statecraft, shrewdness and cunning to appreciate the fact that answering the questions presented represents an Herculean task, even if their separate parts are distributed among a number of sub-committees. Volumes of records and innumerable tables of statistics will have to be consulted and much left uncleared because it is impossible to clear it, and there will be many cases where the final conclusion arrived at and definitely stated on page 1 of a memorandum will be as definitely contradicted on page 20 of the same report." He concludes by expressing the opinion: "that as to the time required for even the preliminary discussion no end can be foreseen. However, Geneva is a very agreeable place of resort and all those taking part in the negotiations there will pass the time interestingly and comfortably."

It might be further said that any person of intelligence reading these "agenda" as a whole and endeavoring to gain a clear understanding of what should be the answers to questions V and VI and their respective sub-sections (a), (b), and (c), cannot avoid reaching the conclusion that any representative who expects to stay

at Geneva long enough to find answers to those sections that will be satisfactory to his own people, to say nothing of the twenty or more other nations involved, will be a proper subject for a padded cell before he leaves Geneva, notwithstanding all its agreeable surroundings.

A NEW WORK ON BALLISTICS.—The *Militär-Wochenblatt* of December 25, 1925, contains an extended editorial notice of a new work recently issued on ballistics by Professor Dr. Cranz, which the writer states is intended as a text book and book of reference to officers of the German Army to enable them to keep up their studies of the progress made in that scientific field and thus overcome, in part at least, the handicap placed upon all German officers by the treaty of Versailles which forbids Germany from organizing and maintaining educational institutions of the higher grade for educating and training officers and enlisted men—a feature that has been given such prominence by their former opponents.

The book, which contains 700 pages, is the advance volume of others that are to follow. The author aims to adapt the mathematical demonstrations of proofs of his propositions to the mathematical training courses of the German high schools. It treats especially of high-angle and direct overhead vertical fire, and the effect and influences of changes of air density due to change in elevation on projectiles at great heights. A special chapter is devoted to long range fire by Professor O von Eberhardt, an associate of the former military training academy. It is said that the incentive to Professor Eberhardt's dissertation on trajectories of long-range projectiles was given him by observation of a shot on the practice ground at Meppen in October, 1914, when the range, according to the usual Siaccissen method of computation ought to have been 38 kilometers but was actually 47 kilometers. He found that air resistance due to diminished density at 20 kilometers elevation was normally only one-fifteenth of that at the firing point. In direct vertical fire it was found that the projectile reached an elevation of 2550 meters with a total time of flight of 74 seconds and velocity, at end of its flight of only 41 meters per second. As an additional merit of the work, mention is made of the many numerical tables that explain and facilitate the practical application of the methods of calculations.

In the section of preparation of tables of fire—for anti-aircraft mountain guns, the means of ascertaining and applying or disregarding influence of special meteorological conditions has been newly worked out by Major of Engineers Dr. Becker based on war experiences.

FUTURE WAR BETWEEN RUSSIA AND POLAND.—The *Militär-Wochenblatt* of December 11, 1925, contains a condensed synopsis of a Memorial purporting to have been submitted to the Polish government by an officer of high rank in the Polish army, in which the author discusses the coming war between Russia and Poland as a certainty of the very near future. The cause of an armed conflict between the two countries is given as dissatisfaction with the boundaries between Russia and Poland existing today and attempts on the part of Russia to recover the territory now held by Poland and which it lost as a result, in part, of adjustments following the end of the World War but more particularly from results of the war between Poland and Russia in 1921.

The writer asserts that, since that event, the Russian General Staff has never ceased in preparing plans for an invasion of Poland and that these plans are amended and modified in the early spring of each year to conform to the ever changing military conditions of each country and to the world conditions of the time being.

The memorial gives a detailed discussion of the probable lines of operation in conduct of the war from the Polish and also the Russian points of view and enlarges,

in the way of argument, on the phases of the several lines of action that are likely to be taken.

The situation, it is asserted, is, for Poland, somewhat similar to that of Germany after the war of 1870-71, when it was in constant apprehension of a retaliatory attack from France but now far less favorable for Poland because France could never have ventured on an aggressive attack against Germany without an ally while Russia does not have to wait for an ally in an attack against Poland.

The region designated by the writer is "the Rokitno marshes," which is assumed to be an extensive tract of low level country crossing the present eastern boundary of Poland in the approximate latitude of Warsaw, and extending some 300 kilometers eastward and about 150 kilometers from north to south. It is marked on maps as "basin of water courses draining the Prypet swamps" and is traversed by numerous rivers and their smaller tributaries, among them the Prypet. From descriptions given, the country is similar, in topographical and physical features, to the Masurian lake regions which played such an important role in the earlier months of the World War in the East Prussian and Masurian Lake campaigns.

The Rokitno swamp or marsh region will, the writer claims, be the principal theater of the coming war and upon its possession and control depends the fate of Poland.

It is quite possible that the "Memorial," if it ever was submitted as an official document, has a suspicious odor of propaganda not very remotely connected with purported measures now under consideration in the Polish parliamentary assembly, to reduce the Polish army for economical reasons. It must, however, be admitted that the geographical position of Poland is not unfavorable to an attempt on the part of the Russian Soviet government, toward quieting any internal dissensions that may arise against that regime by a diversion, or at least a threat, against Poland, its nearest, and in a military point of view, its weakest neighbor. With Germany on its other side, equally eager for a "Restoration of Boundaries" designated by the Treaty of Versailles, Poland's situation is not such as to make it an advocate of a disarmament proposition in which Russia is not a participant.

RIVISTA DI ARTIGLIERIA E GENIO, DEC., 1925. *Fire with Gas and Smoke Shell.* By Captain Gustavo Secco, Italian Artillery.

Starting with a brief discussion as to the propriety of the use of gas in warfare the author indicates the necessity of using two types of attack, one employing gas which is quickly dispersed and one a gas which is persistent. Formulas are given for determining the number of rounds to render a given area untenable.

Considerable space is devoted to smoke-shell fire, the author pointing out the value of smoke screens as well as the advantages of this class of fire in training exercises for artillery and infantry combined, owing to the close analogy of this class of fire with gas attack.

In conclusion the author believes it a serious mistake to assume that the provision of means for transforming peace-time industries into those for chemical warfare or that a study of the problems of industrial mobilization are sufficient preparation for war. He recommends combined artillery and infantry exercises using smoke shell to simulate gas attack and defense.—F. E. H.

COAST ARTILLERY BOARD NOTES

Communications relating to the development or improvement in methods or materiel for the Coast Artillery will be welcome from any member of the Corps or of the Service at large. These communications, with models or drawings of devices proposed, may be sent direct to the Coast Artillery Board, Fort Monroe, Virginia, and will receive careful consideration. R. S. ABERNETHY, Colonel, Coast Artillery Corps, President Coast Artillery Board.

Projects Initiated During the Month of March

Project No. 448, 1926 Modification Antiaircraft Sighting System, 1918 Gun, 1917 Mount (Woody).—Efforts were made during the practice at Fort Tilden in 1925 to remove the backlash from the sighting mechanism of the 3-inch antiaircraft guns, Model 1918, on trailer mounts. Ball bearings were put at the end of the pointer bar to remove friction and the mechanism tightened and adjusted so that a maximum of ten mils backlash was evident at Frankford Arsenal. When in use at Fort Tilden, however, this backlash developed to a minimum of about twenty mils. The backlash in sights not so modified frequently amounted to over one hundred mils. In an effort to overcome backlash, the Richards dual sight was tried in the Hawaiian Department. This sight is the subject of Coast Artillery Board Project No. 406. Other dual sights are the subject of Coast Artillery Board Project No. 449. On January 25, 1926, Lieutenant G. A. Woody, Ordnance Department, came from Frankford Arsenal with a modification of the standard sight to be tested. This sight was installed on one of the guns of the 61st Coast Artillery, and after a limited test the Coast Artillery Board recommended that this modification be adopted for the sighting mechanism for all 3-inch A. A. guns, Model 1918 on 1917 trailer mount.

Project No. 449, Hobson Modification of Antiaircraft Sighting System, 1918 Gun, 1917 Mount.—In November, 1925, a dual sighting system and mounting was suggested by Sergeant Roy Hobson, Battery B, 61st Coast Artillery (AA). A model was constructed by Sergeant Hobson and submitted to the Coast Artillery Board. This sight consists of the telescope from an Altimeter, Model 1917, mounted on the elevation correction bracket between the vertical deflection worm and vertical arbitrary correction worm. In January, 1926, Sergeant Hobson constructed another dual sight. The sight and base are from an Altimeter, Model 1917, mounted on the elevation pointer shaft. Pointing in elevation is done by the vertical gun pointer, vertical deflection, arbitrary deflection and superelevation as in the standard sighting system. The Coast Artillery Board was of the opinion that the second model of the Hobson sights presents an idea that at some future time may develop into a satisfactory dual sight if dual sights prove preferable to single sighting systems.

Project No. 450, Performance Requirements of Service Types, Caliber .30 and Caliber .50 Ammunition.—During the past few years the Ordnance Department has been developing types of ammunition for Caliber .50 aircraft and antiaircraft machine guns in accordance with approved recommendations. The Chief of Ordnance has requested that his office be furnished with a list of the types of Caliber .50 ammunition needed for service use by the Coast Artillery, together with the performance requirements for each specific type. In this connection, particular attention was to be

paid to the maximum armor-penetrating ability required for both Caliber .50 and Caliber .30 machine-gun ammunition. These requirements are now being studied by the Coast Artillery Board.

Project No. 451, Antiaircraft Artillery Towed Target, Air Service Model 1926.—The Air Service has designed a new antiaircraft artillery towed target having the following dimensions: 18 inches open mouth; 3 feet maximum diameter; 14 feet long; and closed tail. Red, white, and black targets of this type were tested and the following conclusions reached: That the target tested is suitable for gun fire on days of excellent visibility for ranges greater than any so far used in target practice; that the red target for day use, white for night, gives greatest visibility; that experiments should continue until a larger target is developed. The target for guns and for machine guns need not be identical. The gun target must give a visible aiming point; the machine gun target, a long material representation of an actual plane. The towing plane must accommodate an artillery observer for gun firings, who can, if necessary, operate the cable winch.

Project No. 452, Cloke Plotting and Relocating Board, T1, for Fort Story.—The Coast Artillery Board was directed by the Chief of Coast Artillery to submit recommendations concerning the details of construction of the platen for the Cloke Plotting and Relocating Board to be tested at Fort Story.

Project No. 453, Firing Tables for 14-inch Gun, Models 1907, M1, firing 1660-lb. A. P. Projectile (Shot).—These tables were examined by the Board and, with minor modifications, reported as satisfactory for printing and issue.

Project No. 454, Gun Quadrants, 12-inch Mortars (Railway).—In firing railway guns at Fort Eustis it was found that the elevation micrometer handle of the Model 1917 gun quadrant would frequently slip during firing and thus introduce appreciable errors in elevation. The Ordnance Officer at Fort Eustis modified one quadrant to eliminate the slipping of the micrometer handle. This quadrant was tested by the 52d Coast Artillery and found to be satisfactory. The Coast Artillery Board recommended that all elevation quadrants, Model 1917 (for both railway guns and mortars) be modified in a similar manner by the Ordnance Department.

Project No. 455, Study of Design of Subcaliber Equipment for 14-inch Railway Gun.—The Ordnance Department has designed a subcaliber mount for the 14-inch railway gun, Model 1920, with which a 75-mm. gun, Model 1916, is to be used. This design was submitted to the Coast Artillery Board for remark. It was the opinion of the Coast Artillery Board that in view of the probable small cost of the subcaliber mount—the subcaliber gun itself being available without additional expenditure of funds—the Ordnance Department should design and construct the first mount in the way which appears most desirable. After construction and service test of the first mount, recommendations concerning desirable changes could be made for use in constructing additional mounts.

Project No. 456, Cole Impact Board.—Captain J. M. Cole, Coast Artillery Corps, has submitted a description and working model of a fire adjustment board designed to replace the Impact Board described in T. R. 435-221, and to furnish a graph of the shoot as is now being done by means of the "Callan" fire adjustment board, described in Mimeograph, Coast Artillery School. This board is now under study.

Project No. 457, Method of Transporting and Housing SCR-132 Radio Equipment (Antiaircraft, Tractor, and Railway Artillery).—The purpose of this project

is to devise standard means of transporting and housing this equipment in the field, with special emphasis on the desirability of using present standard motor transportation.

Completed Projects

Project No. 406, Alterations of Sighting Mechanism for 3-inch A. A. Materiel, Model 1918.

I—HISTORY OF THE PROJECT.

1. Indorsement dated October 24, 1925, from Office, Chief of Coast Artillery, directed a comparative study of two proposed modifications of sighting system on the



FIG. 1

3-inch anti-aircraft gun, Model 1918. The standard modification made at Fort Tilden, consisted of placing a ball bearing at the end of the pointer shaft connecting the sight with the elevation pointer.

2. The Dual Sighting System, as designed by Major W. K. Richards, Ordnance Department, retains the gun pointer's sight on the left of the gun for use in following the target in direction only. On the right trunnion of the gun a panoramic sight is mounted for use in following in elevation. All connecting rods, fuze range disc, vertical deflection, and arbitrary correction mechanism are removed. All vertical angular corrections are combined and set directly on the panoramic sight. A photograph showing the operation of the gun using this system is shown in Figure 1.

3. The first, or standard, modification was used at Fort Tilden during tests when the gun was mounted on concrete blocks. Results were superior to those previously attained. The dual sight was used by Battery D, 64th Coast Artillery, in the Hawaiian Department, with results so satisfactory that authority was requested to convert all guns of the 64th Coast Artillery to the dual sights. Both systems had the modification to the lateral deflection scale described by Major Richards.

4. To hold a comparative test of the two systems, hereinafter referred to as single-sight and dual-sight systems, one gun was equipped with the dual and one with the single-sight system, authority was requested, and obtained, to expend 250 rounds of 3-inch anti-aircraft shrapnel, Mark III fuze. Battery B, 61st Coast Artillery, after several days' training on the dual sight, of a gun crew already trained on the single-sight system, fired both guns, with the same personnel, on the same target on different courses in order to obtain a comparison in accuracy and speed of operation.

5. In connection with Coast Artillery Board Project No. 448, additional test firing for comparison between the Richards Sight and the Woody or 1926 modification was held.

6. No extension was made to traversing handwheel shaft to allow more clearance for the arm of the horizontal deflection setter and no change in handle of this wheel was made. The elevating handwheel however was changed by brazing a circular rim twenty-two inches in diameter, to the old wheel by means of four spokes.

7. The horizontal deflection scales are changed in like manner in both systems. The deflection correction sector is fastened to the projecting index bar of the sight axis by two screws. The sight is then moved in horizontal deflection by means of the deflection correction knob instead of the azimuth pinion knob, which has been removed. This method permits the gun pointer to follow directly in azimuth. It obviates the continuous "fighting" between the sight and deflection index and traversing detail. An extension on the traversing handwheel shaft to place the handwheel four inches farther away from the side of the carriage would facilitate operation at the lateral sight.

8. *a. The Richards Dual Sight.* To alter the 3-inch gun for the dual sight all parts of the sighting mechanism were removed from the right side of the carriage and the pointer shaft from the front. A panoramic sight, Model 1917, was mounted to the cradle trunnion as described by Major Richards. Bore-sighting, however, was not done until after the index had been marked on the panoramic sight. This gave an error of five mils which had to be used as an arbitrary correction set on the angular height corrector (described later). The index of vertical deflection scale on top of the panoramic sight should read 3 instead of 0 when at normal. As the sight had only 600 mils vertical motion, and as the super-elevation is always plus, possibly as high as 250 mils, and the vertical deflection possibly as high as 160 mils, the scale should read from 1 to 7, with normal at 3. This gives 200 mils minus deflection and 400 mils plus. These limits are sufficient for present normal targets, i.e., bombing planes with speeds not to exceed 100 miles per hour. For faster targets these limits will not be satisfactory.

b. The elevating handwheel was enlarged by brazing to the old wheel four spokes and a circular rim twenty-two inches in diameter. The material used was $\frac{3}{4}$ -inch electrical conduit. This change enabled the gun pointer at the panoramic sight to follow with greater ease and uniformity.

c. When the panoramic sight extension is fitted into the slot in the adapter on the trunnion, the extension (and therefore the vertical axis of the sight) is perpendicular to the plane formed by the axis of the bore of the gun and the center line of the trunnions. When the gun is elevated, and the sight is moved in lateral deflection,

the panoramic sight rotates on an axis that differs from the vertical by an amount equal to the angle of elevation of the gun. When gun and panoramic sight point upon a target, they are parallel in the same plane (with no vertical deflection set). If a lateral deflection L is set, the gun and panoramic sight, being on the gun trunnion, are moved ahead of the target. The vertical sight must then be moved back (and through an arc) to get back on the target, but when the vertical cross-hair is on the target the horizontal cross-wire will be pointed below the target. To get on, the gun, and hence the gun sight, is elevated through an angle, which angle is a vertical error. Appendix A gives a mathematical study of the magnitude of this error. With a target speed of 100 miles per hour, hence maximum lateral deflection of about 10° or 180 mils, this particular study gives a maximum of $\Delta a = 8$ mils, always plus. Now as an elevation correction, consisting of vertical deflection, superelevation, and arbitrary correction, is set on the panoramic sight, the quadrant angle of elevation is changed, and the axis of rotation of the head of the panoramic sight may be changed. Tests, however, show that the quadrant angle of elevation seems to be the determining factor in the amount of error when the lateral deflection is constant. Actual tests, using a fixed aiming point and a gunner's quadrant to measure angles of elevation, showed a maximum error of eleven mils for an exaggerated lateral deflection of 180 mils. This deflection is excessive for targets of 100 miles per hour. For faster targets, and possibly greater deflections, a correction for this error could be applied as an arbitrary correction on the Angular Height Corrector. It is believed a chart with curves representing proper correction with two arguments, angle of elevation and lateral deflection, could be placed on the Angular Height Corrector.

d. Because the fuze range disc, the vertical deflection and arbitrary deflection tangent screws have been removed, it is necessary to combine, algebraically, the superelevation, the vertical deflection, and the arbitrary correction in order to place one value upon the elevation scale on the panoramic sight. This was done in the 64th Coast Artillery when they fired with the dual sight by the use of a chart having curves of constant superelevations, with fuze settings and altitude as arguments, and a slide rule. The Coast Artillery Board constructed one instrument to combine all the corrections. The chart has curves of constant fuze settings with altitude and superelevations as arguments, and sliding scales for vertical deflections and arbitrary corrections. Figure 2 is a drawing of this correction board, called herein "Angular Height Corrector." Should the Richards or similar Dual Sight be adopted for use, the Coast Artillery Board is prepared to provide the scales and charts necessary for this board, which can be constructed at any Army post.

e. In the operation of this board, one man moves the ruler to the proper altitude and keeps the super-elevation index set at proper fuze-setting curve. The other man sets the vertical deflection and any necessary arbitrary correction, reading resulting total vertical correction into a mouthpiece. The total time involved is little greater than the time required to set fuze range, vertical deflection, and arbitrary corrections on the gun as in standard system. The board must be operated close to the R. A. Corrector where the necessary data can be heard as they are called in the ordinary transmission of data.

II—TESTS AND RESULTS.

9. a. On November 24 and 25, 1925, upon towed sleeves, firing was conducted with a gun equipped with standard sight and with a gun equipped with Richards Sight. The same gun crew was used in both cases on the same target under same conditions on different courses.

September 24, 1925

<i>Sight</i>	<i>Rounds</i>	<i>Hits (old target)</i>	<i>Hits (new target)</i>	<i>Rate of fire Shots per gun per minute</i>	<i>Shrapnel holes in sleeve</i>
Standard	56	1	2	16.6	38
Richards	57	7	11	16.6	

September 25, 1925

Standard	39	6	5	16	59
Richards	45	4	5	17.2	

The deviations were measured in rectilinear coordinates, not in range-table values, as range errors along trajectory and altitude errors in line normal to trajectory. Using the rectilinear measurements the probable errors developed as follows:

<i>Sight</i>	<i>Lateral P. E.</i>	<i>Range P. E.</i>	<i>Altitude P. E.</i>
Standard	13.8	25.6	28.5
Richards	15.3	25.3	20.2

The range probable errors being approximately equal, the difference between the altitude values of 28.5 and 20.2 indicates more accurate laying of the gun in elevation on the part of the Richards Sight.

b. On February 11, 1926, in firings held for Coast Artillery Board Project No. 443, and conducted similarly to those explained in paragraph 9 *a*, probable errors developed as follows:

<i>Sight</i>	<i>Lateral P. E.</i>	<i>Range P. E.</i>	<i>Altitude P. E.</i>
1926 Model	17	40	40
Richards	17	65	22

These figures further substantiate the indication that the dual sight permits more accurate laying in elevation.

III—DISCUSSION.

10. *a.* The lateral deflections can be set and the gun traversed in azimuth more directly and efficiently with the modifications to lateral deflection scales as suggested for both systems.

b. An extension on the traversing handwheel shaft to place the handwheel four inches further away from the side of the carriage would facilitate operation of the lateral sight. However, this is an aid, not an essential, to successful operation.

c. Increasing the diameter of the elevating handwheel will greatly aid the gun pointer at the panoramic sight to follow the target in elevation.

d. To have a sight for following in elevation placed so that it will traverse on an axis not vertical introduces an error that will require an extra correction.

e. The limited vertical motion of the panoramic sight—600 mils—requires the index so placed to permit 400 mils depression and 200 mils elevation. This corresponds to 400 mils plus deflection, 200 mils minus deflection. The normal should be marked 3, going up to 7 and down to 1. These limits are sufficient for targets not greatly exceeding 100 miles per hour. For targets of higher speed, deflections become larger, and greater motion of sight is necessary.

f. There is no provision on the panoramic sight or gun for an arbitrary correction. The arbitrary correction set on the angular height corrector would apply equally to all guns. Some means of setting arbitrary corrections for each gun should be provided.

g. The Angular Height Corrector (Figure 2) operates successfully to combine the vertical correction into one sum for use on the panoramic sight.

h. The use of two sights enables two gun pointers to follow in azimuth or elevation more easily and accurately than can be done by one man at one sight.

i. The lateral and vertical sights should be yoked together so that motion of one will move the other. This would make positive the pointing upon identical target and would aid both men in following the target. Development seems possible of a single sight with two eyepieces, one for lateral pointer and one for vertical pointer, each directing the gun by a handwheel.

k. The time lost in the range section in the use of the Angular Height Corrector is compensated by the time saved setting the deflections on the gun and by the greater speed of the gun pointers getting back on the target after each shot.

l. The modification of the pointer bar in the Standard System, by the insertion of a ball bearing, removes much of the friction and makes the elevation pointer much more sensitive to vertical movements of the sight. Some of the backlash is removed, but backlash remains and wear and tear of service will increase the amount.

m. The use of a concrete block would doubtlessly increase the stability, and hence the accuracy of fire, with the use of either sight. However, dependence upon concrete foundation should not be permitted to retard the development of a sighting system accurate and efficient for general mobile service use.

n. The most serious disadvantage with the Standard Sighting System is backlash, ranging from 25 to 70 mils in unmodified system, to never less than ten mils in Standard Modified System. Much can be sacrificed to remove all backlash.

o. The Richards Sight involves new drill and methods, and one new instrument (the Angular Height Corrector). The 1926 modification to the Standard System, reported on in Coast Artillery Board Project No. 448, removes all backlash with no change in present methods or drill.

IV—CONCLUSIONS.

11. Advantages of standard sight, modified:

- a.* Reduces friction and drag at elevation pointer.
- b.* By single sight, facilitates "getting on" target.
- c.* Can set deflections for target any speed.

12. Disadvantages of standard sight, modified:

- a.* Backlash remains to some extent, always over ten mils.
- b.* Gun pointer must follow target with the cross-wire intersection, a point.
- c.* Slight errors or looseness at elevation pointer, fuze range disc, or accompanying tangent screws for deflection can cumulate into considerable vertical error.

13. Advantages of dual sight:

- a.* All backlash eliminated.
- b.* Lateral and vertical pointers act directly to point the piece in direction and elevation. No delay caused by "middlemen."
- c.* The task of the gun pointers is simpler. They follow by keeping a line instead of a point upon the target.
- d.* Duties of deflection setters simplified and chances of personnel errors at gun reduced.

14. Disadvantages of dual sight:

- a. In case of multiplicity of targets, delay in getting two pointers upon same target.
- b. Inherent error introduced in elevation due to use of panoramic sight not rotating on vertical axis.
- c. No provision for arbitrary vertical deflection on the gun or for correction after bore-sighting.
- d. Increase of two men in range section to operate Angular Height Corrector.
- e. Involves changes in present methods in drill in range section and gun crew.

V.—RECOMMENDATIONS.

15. The Coast Artillery Board recommends:

- a. That the Dual or Richards Sight be not adopted as standard.
- b. That those organizations now equipped with Richards Sights continue to use same throughout 1926 target practice season to give more opportunity for comparative study of results.
- c. That such organizations using Richards Sights be furnished copies of blue prints of Angular Height Corrector (Figure 2) and study of basic error (Appendix A).
- d. That the advantages peculiar to dual sighting systems be kept in mind in future design of sighting systems for antiaircraft guns.

VI.—ACTION OF THE CHIEF OF COAST ARTILLERY.

473.85/AC-1

1st Ind.

War Department, O. C. C. A., March 10, 1926—To Chief of Ordnance.

1. Attention is invited to the inclosed proceedings of the Coast Artillery Board on Project No. 406. This represents a very thorough study of the advantages and disadvantages of the two general types of antiaircraft sighting mechanisms now in use. This information should be of considerable value in considering the future design of antiaircraft sighting mechanisms.

2. The recommendations of the Coast Artillery Board are approved. Steps are being taken to carry out the provisions of paragraph 15 *b* and *c*.

3. The return of these papers to this office is requested.

APPENDIX A

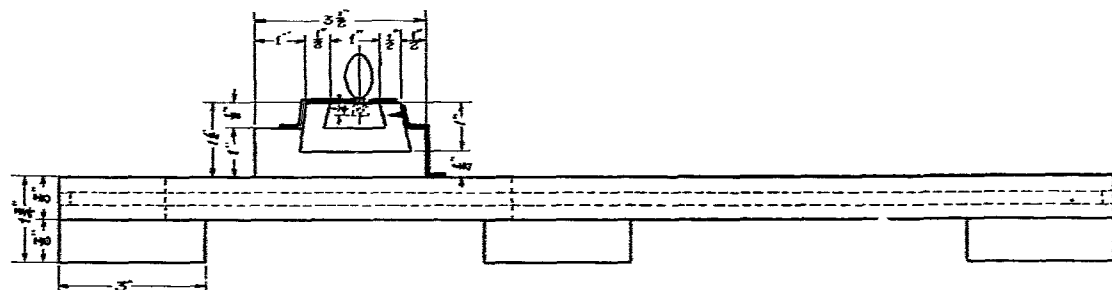
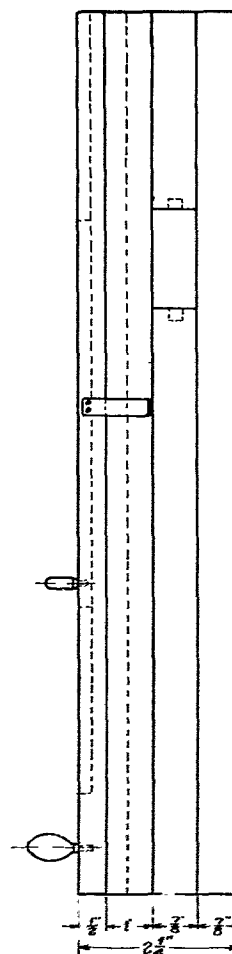
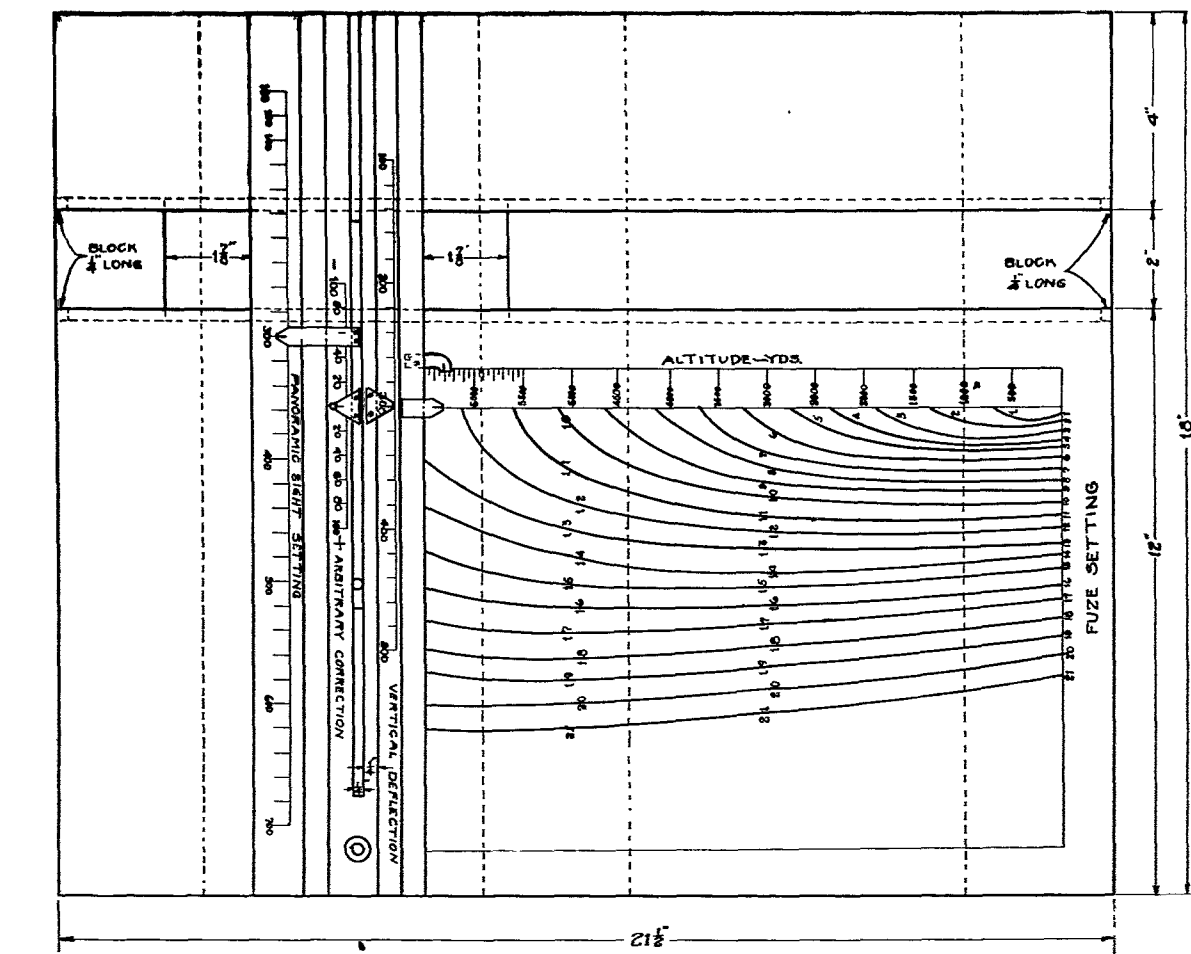
ELEVATION CORRECTION CAUSED BY LATERAL DEFLECTION OF TARGET

If a panoramic sight is fastened to the trunnions of a 3-inch antiaircraft gun, Model 1918, so that the vertical axis of the sight is perpendicular to the plane formed by the axis of the bore and the center line of the trunnions, the angular height of the sight and consequently of the gun will be affected in Case I fire, if the gun is offset by the lateral deflection or the angular travel of the target in a horizontal plane during the time of flight.

Suppose that the lateral and vertical deflections have not been announced and the target is at A, the gun being at O (Figure 3). The gun pointers (lateral and vertical) then move the gun so that the respective sights point at A. The gun then also points at A in the vertical plane OEA along the line OA.

Let the lateral deflection be announced as equal to the angle EOF or L. The lateral pointer will then traverse the gun until it points along OB in the vertical plane OBF. In doing so the line of the bore of the gun passes over a conical surface whose apex is at O and apex angle equal to $180^\circ - 2a$. If the vertical pointer has made no change since first setting on A, the gun will be pointed at B, but his sight will not be on the target.

In order to bring his sight back on the target at A, the vertical pointer now rotates the head of the sight to the left in the plane BDO perpendicular to the vertical axis of the sight. This plane of rotation is tangent to the cone along the generating



COAST ARTILLERY BOARD FORT MONROE, VA			
ANGULAR HEIGHT CORRECTOR			
DRAWN BY	CHECKED	DATE	FILE NO.
<i>for</i>		DEC. 8, 1925	K-122

FIG. 2

line OB. When the vertical pointer has moved the head of his sight back into the plane OEA he will find that his sight is not pointing at the target at A but instead is pointed at some lower point D. The line OD will be determined by the intersection of the plane OEA and the plane of rotation of the head of the sight. He will then come to the conclusion that his gun is not elevated to the proper angular height, and will elevate the sight and gun by the amount of the angle AOD. The angle

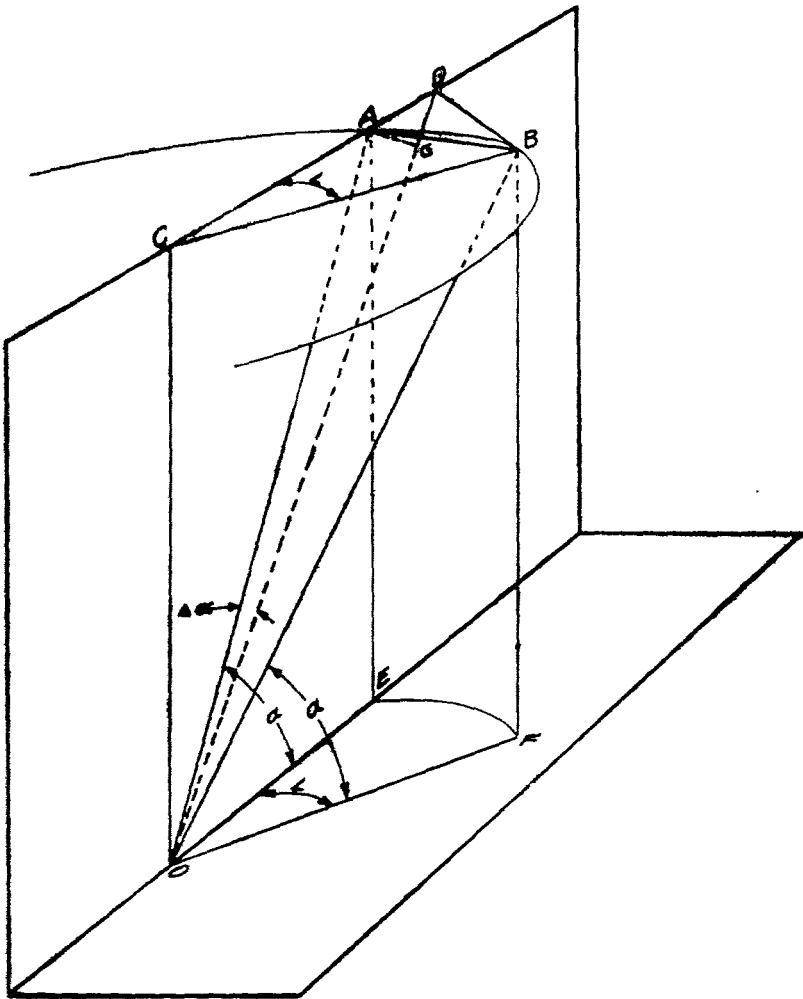


FIG. 3

AOD is such that no matter in which direction the lateral deflection may happen to be the gun will always be pointed at too great an angular height.

The value of the angle AOD can be computed as follows:

Let the gun be at O, and target at A

Let angle EOF = L = lateral deflection

Let angle AOE = angle BOF = α = angular height of target

Let OA = OB = R = slant range to target.

AB will be the part of the circumference of the horizontal circle which is generated by the point A when the gun is moved through the lateral deflection angle L. The center of this circle is at the point C, the plane ABC being horizontal. The radius of the circle is:

$$\begin{aligned} AC &= BC = R \cos a \\ CD &= \frac{CB}{\cos L} = R \frac{\cos a}{\cos L} \\ AD &= CD - CA = R \frac{\cos a}{\cos L} - R \cos a \\ &= R \cos a \left(\frac{1}{\cos L} - 1 \right) \end{aligned}$$

AD is in a horizontal plane; to change this into its equivalent vertical angle:

$$\begin{aligned} AG &= AD \sin a = R \sin a \cos a \left(\frac{1}{\cos L} - 1 \right) \\ \sin AOD &= \frac{AG}{OA} = \frac{AG}{R} = \sin a \cos a \left(\frac{1 - \cos L}{\cos L} \right) \end{aligned}$$

If L and AOD are small, $\cos L = 1 - \frac{L^2}{2}$ and $\sin AOD = AOD$

$$\therefore AOD = \sin a \cos a \left[\frac{1 - \left(1 - \frac{L^2}{2} \right)}{1 - \frac{L^2}{2}} \right] = \frac{L^2}{2 - L^2} \sin a \cos a$$

Since L^2 is small compared with 2, the denominator may be written 2, and the whole expression then reduces to $\sin a \cos a \frac{L^2}{2}$

If L is expressed in mils, $AOD = \frac{L^2}{2000} \sin a \cos a$

To find the maximum value of the angle AOD or Δa for a particular value of L:

$$\log AOD = \log \Delta a = \log \frac{L^2}{2} + \log \sin a + \log \cos a$$

$$0 = \frac{d \Delta a}{\Delta a} = \frac{\sin a}{\cos a} - \frac{\cos a}{\sin a} d a$$

$$\frac{\sin a}{\cos a} = \frac{\cos a}{\sin a}$$

$$\sin^2 a = \cos^2 a$$

$$\cos^2 a - \sin^2 a = 0$$

$$\cos 2a = 0$$

$$2a = 90^\circ$$

$$a = 45^\circ$$

When $a = 45^\circ$,

$$\Delta a \text{ max} = \frac{L^2}{2} \times .7 \times .7 = .25 L^2$$

If L is expressed in mils, then

$$\Delta a \text{ max} = 2.5 \times 10^4 L^2$$

If L = 180 mils, about 10° ,

$$\Delta a \text{ max} = 8 \text{ mils.}$$

If superelevation and vertical deflection are applied to the head of the panoramic sight before the lateral deflection is applied, the cone cut out by the axis of the bore will have an apex angle equal to $(180^\circ - 2i)$ where i is the angle of elevation. The head of the sight will return in a plane which is tangent to the cone along the line of the bore of the gun when directed at the setforward point. When the vertical wire in the head of the sight has returned to the vertical plane containing the target the horizontal cross wire will be below the target by the amount $\frac{L^2}{2} \sin i \cos i$. This can be shown mathematically in a manner similar to the one used above. The maximum value for this expression will also occur at 45° elevation and will be equal to about 8 mils for L equal to 10° .

BOOK REVIEWS

The Direction of War—A Study of Strategy. By Major General W. D. Bird, C. B., C. M. G., D. S. O. Cambridge University Press. 1920. 6½"x 9½". 317 pp. Maps.

This is a day of inventions and discoveries. Inventors and discoverers of alleged new principles of war abound in the land, and in the popular magazines. It is refreshing to pick up a military text whose preface begins with this—"The principles that govern the direction of war are constant * * * ." But one remembers that almost all military authorities believe the same thing and practice accordingly, and that all these innovations are products of untrained, though vivid—perhaps fevered—imagination.

The present work is orthodox in the best sense, not dry as dust, not lacking in originality, and least of all a mere compilation. It discusses the management of operations under time-honored topical headings—although the division into chapters gives the appearance of serialization on magazine space basis—and illustrates each point by one or more well-chosen historical examples with sketch maps.

Temptingly quotable passages abound. For example every Army and Navy officer, and every statesman as well, can find food for thought in this: "Strategy may be defined as the direction or management of war; and strategy in peace will, therefore, comprise the management of all national resources so that they may be capable of being exploited not only to the greatest possible extent, *but also at the time when they will be most useful * * * in war.*" (Reviewer's italics); and this: "Extravagance in expenditure on any service is to be deplored, for all excess is injurious, but insufficient provision for national security is surely a worse evil;" and again in this: "The objects for which war is undertaken * * * are gained by bringing the pressure of public opinion to bear on the government of the enemy's country. This is best effected through the destruction of the enemy's armed forces." To the last the reviewer takes the liberty of adding: " * * * and not by bombarding, aerially or otherwise, his centers of population."

The discussion in Chapter III of the influence of Sea and Air Power is particularly interesting. The author's conclusions are indicated by the following: " * * * the results obtained from maritime superiority alone are like, as a rule, to be inconclusive;" and "The full development of air power cannot as yet be clearly foreseen. * * * As in the case of maritime supremacy, however, air supremacy will not of itself be conclusive in war against civilized nations, unless some explosive or gas is produced, which far outstrips those now in use both in power and effect."

Passing from national policies and peace strategy to the management of operations in campaign, the writer finds himself, as will the military reader, more at home. Particularly interesting examples and discussion are to be found under the headings: "Attack on Communications"; "Influence of Obstacles" (including a coast line); "The Time Factor"; "The Influence of Fortresses"; and "Moral" from which the following is quoted: "Moral is the product of good leadership, of success, of good organization, discipline, and training, which inspire self confidence, * * * ." "Of these factors the most important is leadership * * * "

In the concluding section, entitled "The Management of Operations," the following are found:

War, indeed, is not an exact science but an affair of calculation and judgment; and war can no more be made by text-book rule and formula than a picture can be painted.

On the other hand, military inspiration will not come except to those who possess the knowledge necessary as a medium for its production * * *.

* * * A general, further, must be competent to calculate chances, to weigh each situation on its merits, making due allowance for the various moral, material and technical factors, both as regards his own and the enemy's forces, which must be taken into account in every military operation; and, since in war there is rarely time for reflection, he must be able to pronounce rapid but valid judgments.

There are indeed but few men who possess the vigorous constitution, the intellectual ability, and the moral ascendancy characteristic of great commanders.

In fine, this work should be valuable to anyone interested professionally in military operations.—R. S. A.

A Short Account of the Russo-Japanese War. By Footslogger. Forster & Co., Ltd. 1925. 5½"x 8¾". 88 pp. Maps. 5s.

An English Army officer has written a short account of the Russo-Japanese War for use in preparing for examination for promotion. Each operation is described and deductions made therefrom to show how far recognized principles of war were adhered to or departed from.

General Sir Horace Smith-Dorrien says in the foreword:

I regard the Russo-Japanese War as the most interesting and most instructive modern campaign of open fighting which has ever taken place, and for that reason I consider it should be studied by all officers.

The skillful preparation and thoroughness of the Japanese were a model at that time, and far in advance of anything the world had seen in the way of modern warfare.

Were I asked what particular principle stood out beyond others as proved to the hilt in that war, I should say it was the marked advantage of the offensive. The force taking the offensive makes its own plans and follows them, whereas the one on the defensive is in a chronic state of anxiety and has to conform to the movements of the adversary. Kuropatkin lived in a fog.

The book is well adapted for the purpose for which it was written.—W. W. I.

The Conquest of the Philippines by the United States, 1898-1925. By Moorfield Storey and Marcial P. Lichauco. G. P. Putnam's Sons. 1926. 6"x 8¾". 274 pp. \$2.00.

This latest contribution to the study of American relations with the Philippines is a plea for Philippine independence. Mr. Storey, an eminent lawyer of Boston, has been prominent in anti-imperialistic circles for two decades. Sr. Lichauco is a Filipino graduate of Harvard College. Their work is a criticism of the American regime in the Islands. The entire period of our regime there is covered, with the main attention devoted to the first years. Their intent is to create certain impressions.

A brief review of the early history is made to show that our entry into Philippine affairs was not altogether due to unselfish motives. Our military and naval leaders are charged with misleading the Filipinos into the expectation of immediate independence. From this point the charge is made that the American military forces were

responsible for the Filipino Insurrection and that, in quelling the insurrection, the military commanders did not require their forces to abide strictly by the rules of civilized warfare. Specifically, the authors charge that looting was customary; that prisoners were harshly treated, and even murdered, on the battlefield. By innuendo they convey the impression that our armies marched through portions of Luzon literally sweeping the country clean of able-bodied Filipino men.

Passing over the period from 1901 to 1913, the authors pay tribute to Governors-General Taft and Forbes, but criticize the policies of these administrations. Little reference is made to the Harrison administration. However, the authors muster up the courage to cite the record of this administration as an example of the ability of the Filipinos and their capacity for democratic government. Apparently they realize that they are on dangerous ground, for they leave this period with the greatest dispatch. Statistics are given to show the increase in the number of schools, school attendance, and road mileage from 1913 to 1920. No information is given as to the type of educational work done, nor is sufficient data given to show the actual progress made in the maintenance of roads or other public improvements. No reference is made to the history of the Philippine National Bank, wherein the sum of \$37,500,000 of the public funds was lost either through poor management or graft or both. The story of the purchase and operation of the Manila Railroad is not mentioned. Here 80,000 free passes were granted in one year on this road with a mileage of less than 700 miles. Several "National Companies" were launched and the net result in most cases was a loss of government funds. The authors mention the Philippine Independence Commission, but they do not tell us that this commission expended from public funds from \$250,000 to \$500,000 annually for six years (1918-1923) in spreading propaganda (largely in the United States) for Philippine independence.

This question is not a simple one. The student of Philippine affairs is confronted with an array of conflicting evidence. The preponderance of authoritative evidence, however, indicates that our immediate withdrawal from the Islands would be unwise on our part and unfortunate for the masses of Filipino people. The authors of this book take the other viewpoint and they present their arguments well. Their work is carefully and ably done, their references are to authoritative documents, and the book is interesting, but the reader will realize that only one side of the question is being presented.—C. S. H.

The New History and the Social Studies. By Harry Elmer Barnes. The Century Company. 1925. 6"x 9". 605 pp. Ill.

Perhaps as accurate a characterization as any, of this work, is that it constitutes a manual of orientation for the relations between genetic and synthetic history and the sciences of geography, psychology, anthropology, sociology, economics, political science, ethics, and the history of science and technology. The ground for all this discussion is prepared by an introductory chapter summarizing past, present, and future trends in viewpoints governing historical work itself, and a final chapter is devoted to an examination, from the standpoint of history, of the bearing of social intelligence on the solution of human problems.

While this book may be called a manual, it can hardly be called a handbook, for it is monumental in scope and encyclopedic in treatment. The reviewer happens to be keenly interested in the social studies which are the great concern of this work, and is familiar with many of the books which are freely cited and quoted therein. Consequently he has found it quite impossible to skim the book in traditional book review fashion, but instead has spent every available evening for many weeks

in reading it carefully from cover to cover. The significance of the interjection of this apparently autobiographical note is intended to be twofold: first, that to the serious student, either of history or of any of the humanistic sciences, Professor Barne's synthesis of the subjects covered will prove an available tool in the correlation of his own efforts; and second, that the casual reader, previously uninformed and uninterested in the technical methods and terminology of any of the fields covered, would very possibly be foundered, in the third chapter, if not in the first or second. For this book is primarily technical in method, planned and written for the assistance of historians and social scientists, with the further purpose always manifest of an attempt to secure a more sympathetic appreciation and more specific mutual helpfulness, between the specialists in the several fields which are the concern of the book.

Fundamentally, the work of the author has been that of compilation. If the result had been merely compilation, the book would have undoubtedly been useful, but must surely have been mediocre. Fortunately, the author has nowhere succeeded, if indeed he tried, to suppress his own incisive personality. While quotation bereft of context is apt to be misleading, perhaps the following (from page 467), presents not unfairly the personality of the author and the thesis of the book:

It is the opinion of the writer that ultimately, perhaps, it will be logical for history as a special and distinct subject to disappear, having justified its long existence and having left an indelible impress upon human culture through having developed a perspective and method which will by that period have conquered all departments of the study of human life and culture. With the growing complexity of social phenomena it means that the longer history continues to maintain itself independent from specialists in literature, art, technology, science and the social sciences, to that degree it must remain more naive and superficial in its efforts. It may, perhaps, at the proper time abdicate; with the comforting assurance that the genetic method of approach will dominate or receive proper cultivation in all types of approach to human and social problems, and that the historians of the future will find the most efficient and congenial field for their activities in the historical sections of departments of literature, art, science, technology and the social sciences.—F. S. C.

Military Aid to the Civil Power. By Major Cassius M. Dowell, General Service Schools, Fort Leavenworth, Kansas. 1925. 6¼"x 9¼", 330 pp. \$1.50.

This volume is designed to serve as a practical guide for officers of the United States Army. Its purpose is to extract the salient principles involved in the Laws of War, Military Government, Martial Law, and Domestic Disturbances and to give them practical application in concise and usable form. It comprises five chapters and four appendices.

The first and second chapters are devoted to International Law and the Laws of War. The third chapter, devoted to Military Government, is perhaps the most interesting chapter in the book. The author explains clearly what military government is, its relation to the local civil government and the inhabitants, its authority and responsibility. He makes a brief survey of the exercise of military government by American military forces and classifies such cases into three typical situations. Sections on Military Government in Porto Rico, Military Government in Cuba, and Military Government in Germany furnish a concrete study under each particular situation. The fourth and fifth chapters cover Domestic Disturbances and Martial Law. The appendices furnish forms to be followed in particular cases. Throughout the volume the author draws illustrations from the history of our military forces, thereby adding interest and practical value to the work.—C. S. H.

Campaigners Grave and Gay. By L. H. Thornton. The Macmillan Company. 1925. 5½"x 7¾". 323 pp. \$3.00.

This is a book well worthy of a place in every officer's library. It is exceedingly entertaining, and of unusual interest to the military reader. Its appeal will extend far beyond the limited number of those engaged in historical and military research.

The author, Lieutenant Colonel L. H. Thornton, as Director of military studies at Cambridge, delivered a series of biographical lectures on the careers of distinguished soldiers, with the object of interesting his audience in the study of military history. In this he must have succeeded, judging from this selection of four biographical sketches, the subjects of which are Marshal Maurice de Saxe, Major General Sir Robert Rollo Gillespie, Lord Peterborough, and Major General James Wolfe.

The account of the life and activities of Marshal Saxe is very diverting and would keep the most confirmed post-prandial slumberer awake. The old marshal, commander-in-chief for Louis XV in Flanders against the British and their allies, furnishes excellent reading matter for anything from a Woman's Club to a class at the War College.

General Gillespie, a brave and gallant soldier, served with distinction in India and the East Indies. His exploits, so ably presented, should inspire every youth who admires courage and every military man who realizes the value of quick decision and valiant personal example.

The able but eccentric Lord Peterborough is portrayed in the third sketch. His activities in Spain in the early years of the eighteenth century (1705-1707), his daring and successful ruses, his numerous disagreements with his colleagues, form a romantic chapter.

To the average American reader James Wolfe, the conqueror of Quebec, has always been a heroic figure. His recital of the lines from Gray's *Elegy*—

The boast of heraldry, the pomp of power,
And all that beauty, all that wealth e'er gave,
Awaits alike the inevitable hour.
The paths of glory lead but to the grave.—

is known to every school boy, and the classic battle on the Plains of Abraham, in which both brave leaders, Wolfe and Montcalm, were killed, is properly emphasized in every school history. That Wolfe has earned his fame is aptly expressed by the author in his concluding paragraph.

It has been given to few men to meet so timely an end. Wolfe was but thirty-two years of age when he fell, but had he survived the battle, there can have been but a brief span of life remaining to him, so many and so grave were the disabilities from which he suffered. His course was indeed well-nigh run. It was, in truth, no unkindly Fate that took him in the hour of victory—a victory, too, so dramatic in its setting, so momentous in its consequences, that the name of the victor has been written large in our national history on the pages sacred to those whose deeds have most contributed to the greatness of their country.

The book is well supplied with maps and has an excellent index. The reviewer recommends it as an early addition to your library.—R. V. C.

The Historian and Historical Evidence. By Allen Johnson. Charles Scribner's Sons, 1926. 5¾"x 8¾". 179 pp. \$2.00.

History comes to us as a great mass of tiny bits of information which must be sifted and sorted and pieced together into a mosaic reconstructing, with as much accuracy as possible, the original from which the pieces were derived. Since the

past, however recent, exists only in man's mind, the accuracy of the mosaic will be entirely dependent upon the accuracy of receptivity of the minds of the original participants and eye-and-ear witnesses. Man's mind most decidedly is fallible—he sees and hears what past experience has taught him to see and hear. Hence, any narrative of past events is, at best, bound to be inaccurate, and any reconstruction will very probably contain some of the original inaccuracies.

Eighteen centuries ago Plutarch remarked “how very difficult is it to trace and find out the truth of anything by history.” With this we can agree, but Walpole carries the thought a bit too far when he considers that “history must be false.” However, no historiographer will claim that he can learn the exact truth in all detail. The best he can hope for is to arrive at a high degree of probability.

Professor Johnson points out in his book just what the task of the historian is—how the many elements of information which enter into the writing of history are collected, sifted, sorted, classified, doubted, criticized, tested, and proved. He traces the evolution of historical study to the scientific historiographic methods of today. He points out the tremendous task faced by the student in searching the past, and he shows how other branches of learning—experimental psychology, paleography, paleology, philology, and so on—contribute to historical research. The book is a brief but a very readable and informative presentation of the subject.

Progress and the Constitution. By Newton D. Baker. Charles Scribner's Sons. 1925. 5¼"x 7¾". 94 pp. \$1.25.

This little book comprises three William H. White Foundation lectures delivered at the University of Virginia by the former Secretary of War. The first lecture is the title of the book; the second is “The Constitution and Industry,” and the third, “The Constitution and Foreign Relations.” The latter discusses the conflict between President Wilson and the Senate concerning the Versailles Peace Treaty. The lectures, along the line of thought which they follow, are a valuable contribution to a study of the Constitution.—L. M. C.

American Citizenship. By John W. Davis, Philip Cook, Albert C. Ritchie, Luther B. Wilson, Charles E. Hughes. Thomas L. Crowell Co. 5"x 7½". 88 pp. \$1.00.

This is a series of addresses given over the radio, and arranged for by a special committee of the American Bar Association, on American Citizenship, each address stressing the importance of personal responsibility in regard to citizenship. These addresses, having been bound together in this little volume, are a permanent contribution to the effort being made toward better government in America.—L. M. C.

Fighting Red Cloud's Warriors (The Frontier Series). By E. A. Brininstool. The Hunter-Trader-Trapper Co., 1926. 5"x 7¼". 241 pp. Ill.

An interesting collection of true tales of Indian fights and frontier incidents: The Tragedy of Fort Phil Kearney; The Wagon Box Fight; The Island of Death; The Buffalo Wallow Fight; Tobey Riddle; Jim Bridger; Calamity Jane; In the Days of the Buffalo; Freightling Across the Plains; “Remember the Alamo!” Colonel Homer W. Wheeler includes some of the incidents in less detail in his *Buffalo Days*.

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